

# THE IRON AGE

New York, May 10, 1923

ESTABLISHED 1855

VOL. III, No. 19

## Suggested Economies for the Railroad Shop

What an Eastern Line Has Done to Expedite Repairs  
by Modifying Practices and Preparing for  
Needs in Advance

BY L. S. LOVE

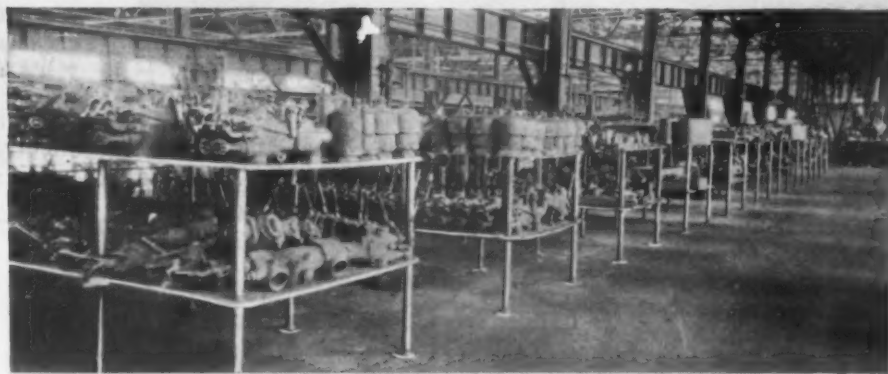
**R**EPRODUCTIONS of a number of photographs covering improvements made by an Eastern railroad are here shown by way of suggestion of methods which may be profitably employed by roads which have not worked out such economies for themselves. As such they are supplementary of

a locomotive requires a new piston, one in semi-finished condition is drawn from the stores. The finishing requires about 1½ hr. instead of 8 to 10 hr., were the rough part to be machined and the engine may be delivered back to service so much the sooner. Main rod brasses are finished except for the actual pin fit. Driving boxes with crown brasses are all fitted and machined ready to draw from stock, requiring only boring and facing, which takes about 30 min. Eccentrics and straps and many other parts are handled in a similar manner.

Where a railroad is not in position to carry all parts in stock it has been suggested that so-called service stations could be resorted to. Such a plan would not necessarily contemplate the making of



Old Wooden Storage Shelves Were Replaced with Shelves Built on Pipe Stands, Increasing Accessibility and Giving a Clear View of the Department



a collection of photographs published on page 881 of the issue of March 29.

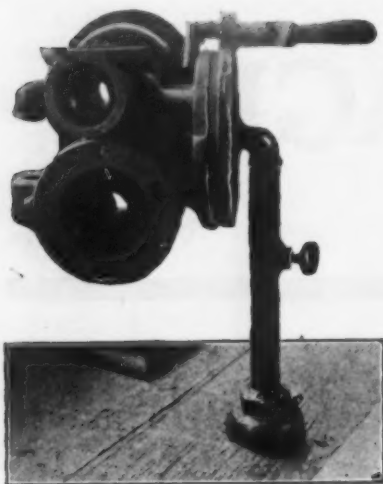
Many uneconomical practices now followed in railroad shops can be corrected at comparatively slight expense. The corrections would bring about lower actual costs of operation and, what is most important, an earlier return into service of the motive power or rolling stock. Some of the changes might call for the addition of equipment. Others would require only the making of some fixtures or fuller use of available machinery.

The railroad used as the example carries many parts in the stores in finished or semi-finished condition instead of carrying rough parts. This practice materially shortens the time required for the actual fitting of a repair part. For instance, when

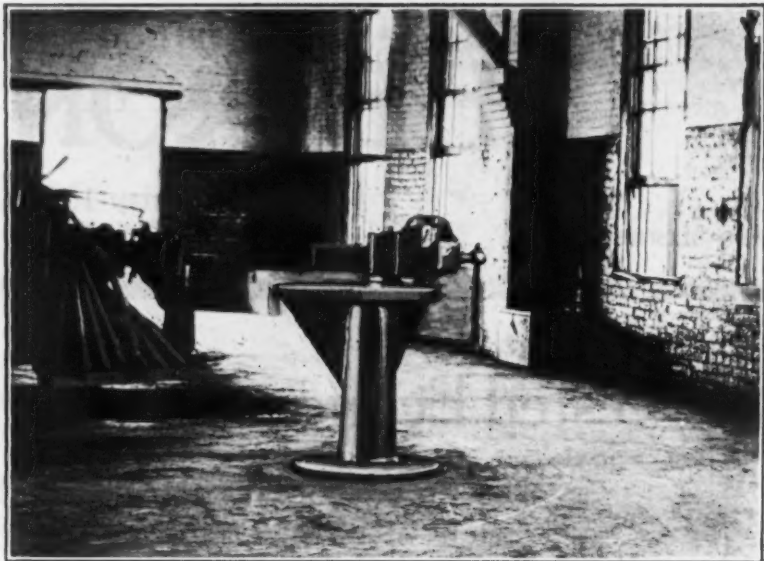
wholesale or class 1 repairs on the outside, but simply to utilize outside facilities to hasten the return of the locomotive to service.

Such parts as cylinder cocks, mud plugs, etc., can be made up in large quantities in a central shop and distributed over the system. As a concrete example, tank hose nuts were formerly made in the various shops and round houses as they were needed. These required about 9 hr. each average time. A multiple spindle chucking machine was installed in the road's main shop, whence they are drawn by requisition for use of other shops. The chucking machine is operated by a less skilled man than was formerly needed to make these nuts and they are turned out at the rate of 6 min. each.

One contention has been that railroads having



For Expediting Repairs on Triple Valves, an Adjustable Stand Was Designed



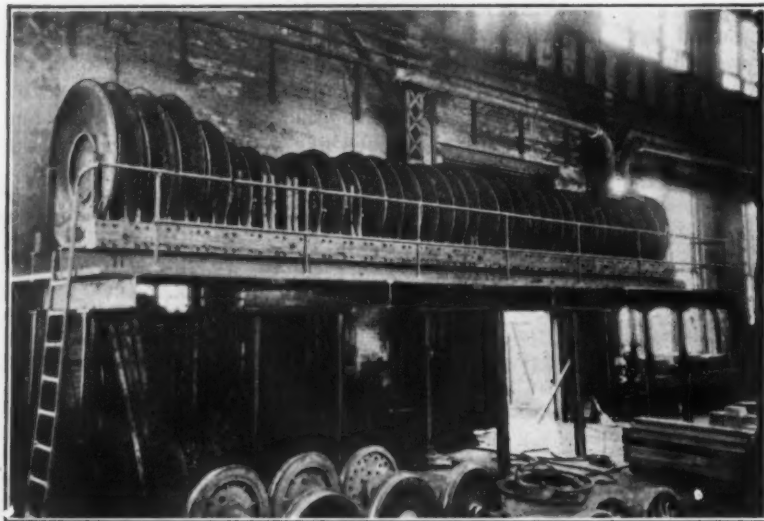
Cleanliness Being Considered Important, Stationary Vises Where Required Were Mounted on Substantial Iron Stands Imbedded in the Concrete in Shops and Round-Houses

many types of locomotives for different classes of service and of different periods of design cannot standardize on parts. This is not altogether so. Many parts can be made interchangeable on certain

mill white. The next step was rearrangement of storage bins and other space. It was found that much time was lost through re-tracking of material and through needless steps on the part of the men. To overcome this condition the dismantling section of the erecting shop and the finishing pit were so arranged that material could progress in a forward direction without retracing. The machine shops were re-arranged with the same idea in mind—to expedite production and save lost motion.

By changing storage space, accommodations were gained for two more locomotives. Obstructions were removed and cleanliness in the shop emphatically required, both facilitating increased production. Benches with vises in the erecting shop were placed for convenience of use or provided in portable form to save

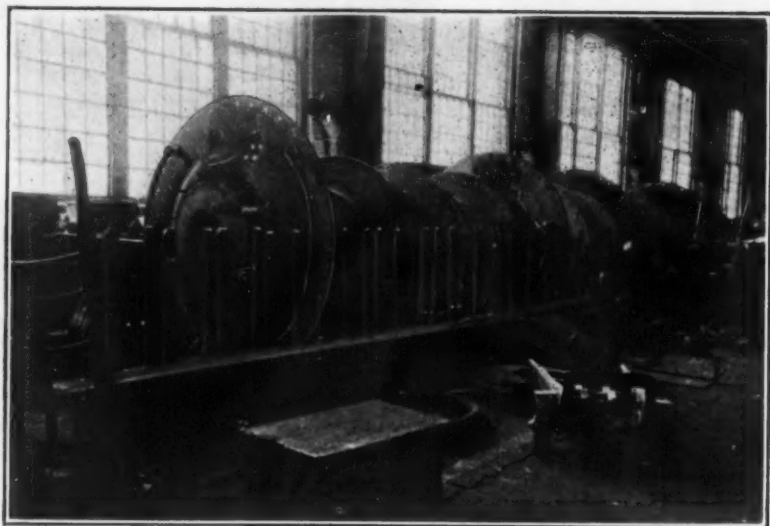
steps and consequently time. The question of transportation of materials was



Front Ends of Locomotives Undergoing Repairs Are Now Carried in Racks Within Reach of the Overhead Cranes

classes; others can be wholly standardized. One point must be borne in mind which is that the standardization must not be carried far enough to stop development and improvement. As new locomotives are added they can follow one or another design, depending upon the service to which they are to be put. Where five locomotives of a class are in use, parts for one complete locomotive of that class may be carried in semi-finished or finished stock. This expense would more than be justified in the saving of time in the shop of the locomotive undergoing repairs.

Some of the changes instituted in arrangement of shop, saving of space, design of tools and fixtures and improvement in methods are shown in the groups of pictures. A first consideration was improvement in light conditions. The whole shop was painted with a



Formerly the Locomotive Ends Took Up Valuable Floor Space and by the Arrangement Shown in the Companion Picture Working Space Was Obtained for Two More Locomotives



accepted as one of prime importance. The old time hand truck which carried comparatively little and required several men to push it has been supplanted by electric industrial trucks and trailers. These serve erecting shop, car shop and machine shop and also the yards. The trailers are of the tracking type and are used to save stoppage of the electric truck while loading.

Other improvements will be shown in a group of pictures to appear in a later issue.

### Pittsburgh Base Hearing at Birmingham Is Brief

BIRMINGHAM, ALA., May 7.—Nothing new developed here at the Federal Trade Commission hearing in the Pittsburgh plus case, held last week by Examiner John W. Bennett. The principal witnesses were J. W. Whately and Willard Wilson, of the sales department of the Tennessee company, and James Bowron, chairman Gulf States Steel Co. Restatement was made of the sales policy of the Tennessee company, which is to make concessions to Southern steel consumers. The concession averages about \$5 of the freight from Pittsburgh to Birmingham, but there are times when less than that is charged in competition for business.

Mr. Bowron declared the Pittsburgh basing point a trade convenience that ought to be maintained and said that the independent steel industry in the South in its undeveloped state was better able to do business with the Pittsburgh plus than without it. Representatives of the Knoxville Iron Co. and Atlanta Steel Co. were also heard.

Karl E. Steinhauer, attorney for the commission, says testimony obtained at Birmingham discloses that full Pittsburgh price plus freight is charged on wire products and that the concession of \$5 and sometimes more per ton applies to plates, bars and shapes.

### Forms a Twenty-Year Service Club

Twenty members of the force of the Albany Hardware & Iron Co. who have served at least 20 years with the company met for dinner in Albany, April 30. Many of them have been employed for a greater number of years, ranging up to 35 years and more. They formed a 20-yr. service club.

W. I. Baker, president of the company, was toastmaster. William E. Foskett, who originated the idea of the club, outlined the idea, the ideals and objects of the proposed club. The proposal for election of officers brought forth the sentiment that the officers of the Albany Hardware & Iron Co. should have the honor of being the first officials of the club and they were duly elected as follows: William I. Baker, president; William B. Wackerhagen, vice-president; James K. Dunscomb, treasurer and William E. Foskett, secretary.

The name Ahico Twenty-year Service Club was adopted as the official title.

### Unfavorable Report on Iron Ore

The Alberta Scientific and Research Council has issued a report based on a survey of the Butterfield claims on the north shore of Lake Athabasca by professors J. A. Allan and A. E. Cameron last summer, which has resulted in the statement that there is no prospect of developing an iron mining industry in this district. The report states that traces of iron were found, but that samples tested out only 4.22 to 34.02 per cent and the highest shown in picked specimens was not more than 38.22 per cent. No reason is believed to exist for expecting to find any better values at greater depths. Even if large deposits of high grade ore should be discovered in the future, the report further states, they could not be economically developed because of the high transportation costs that would be involved. It is also pointed out that the possible market for pig iron and steel products from the north would be limited chiefly to the Province of Alberta, owing again to the cost of transportation,



Portable Work Benches Provide for Workmen Taking Vise and Tools to the Job, Instead of Running Back and Forth from the Engine and Stationary Bench

and there is not "sufficient consumption of these materials within that area to keep one medium sized blast furnace in operation."

Considerable publicity has already been given to reputed iron ore discoveries in the north, the news having gone out that there were millions of tons of commercial ore on the claims referred to; but the Allan-Cameron investigation makes it clear that hopes of striking paying ore in that district must be abandoned.

### New England Foundrymen Visit General Electric Co. Plant

The New England Foundrymen's Association was the guest of the General Electric Co., Lynn, Mass., Wednesday afternoon and evening, May 9. Early in the afternoon, members of the association assembled at the River Works of the company. Subsequently they were conducted in small groups through the apprentice department, pattern shop, dispensary, chemical laboratory, iron, steel and brass foundries. Dinner was served at 6 p. m. in the company's restaurant, at which George A. Ray, president of the association, presided. H. M. Lane, president H. M. Lane Co., Detroit, industrial engineer, gave a talk, accompanied by slides, on foundry riggings to reduce cost, increase accuracy and speed up production. Mr. Lane's talk was along the same lines as before the National Founders' Association last fall.

The association has an interesting summer season planned. Next month it will be the guest of Worcester, Mass., members. Various plants will be visited and a dinner served on the shores of a lake. Providence, R. I., members will entertain the association at an old-fashioned clam bake in July. The association in August will be the guest of the New England Coal & Coke Co. Present plans call for a sail down Boston Harbor, an inspection of the company's ovens at Everett, and a dinner at the City Club, Boston.

### To Push Marine Standardization

At a meeting, April 17, of the standardization committee of the American Marine Association, a plan of organization was adopted and three sub-committees appointed concerned with organization, membership and finance; constitution and rules; publicity and relations. The work of the committee is intended to benefit the marine industries of the United States by establishing recognized standards for hull, engineering and operating details and thereby reduce the cost of ship construction and operation. This should make competition with foreign shipping on more equal terms and place the marine field more in line with other branches of engineering effort.

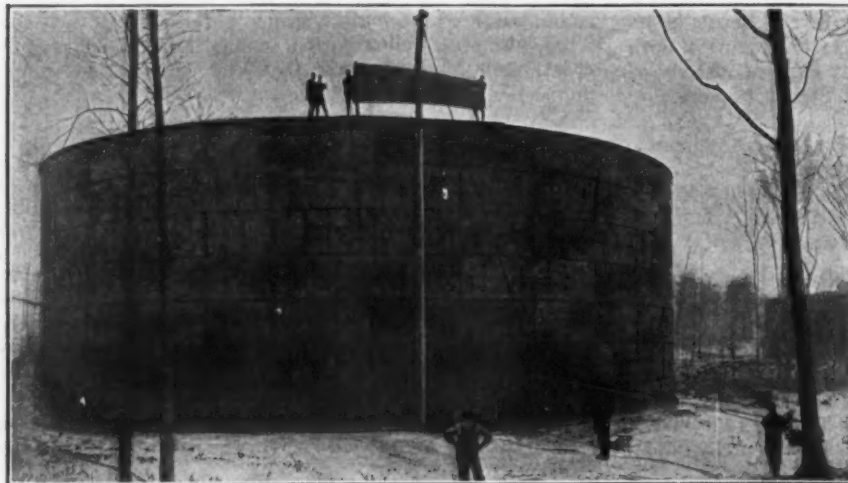
The next meeting of the committee will be held at the U. S. Shipping Board office, 45 Broadway, New York, on June 5.

### Air Hoists Facilitate Tank Erection

Eighteen 100-ft. steel oil storage tanks spaced over a 1700-acre tract of land near Palisades, New Jersey, are being erected by the Warren City Tank & Boiler Co., Warren, Ohio, for the Standard Oil Co. It is estimated that the job will be finished in nine months, which is notable in view of a similar previous contract that took two years to complete. To the more efficient handling of material, and particularly to the employment of an air hoist, is attributed a large share of the reduction in the erecting time.

One of the tanks is shown in the illustration. The component parts comprise a framework, shell and roof. The framework is made up of eight 1-in. beams, eight circle beams, rafters and other parts, and the shell consists of seven sections, with 16 side sheets and seven rings to a section. The side sheets are 20 ft. long by 5 ft. wide and weigh about one ton each. The roof is made up of 144 steel sheets,  $19\frac{1}{2} \times 5\frac{1}{2}$  in., weighing 500 lb. each. Between 40 and 50 men are employed on the work, including seven gangs of riveters, four caulkers and five reamers.

The efficient handling of the steel side sheets, rings, structural iron and the roofing sheets has been the problem in field construction work of this kind, the actual fitting taking but a small part of the total time of erection and the handling of the material taking the



greater part. Formerly the material was hoisted by means of a team of horses, and A-frame with double block being used for the heavy bottom side sheets and a gin pole with single and double blocks for the roofing sheets. In fitting the structural iron, however, it was necessary to hoist by hand.

On the present job a Turbinair hoist of the Sullivan Machinery Co., Chicago, is employed to handle the material. The hoist has a capacity of 2000 lb. vertical lift, and a rope speed of 110 ft. per min. at maximum load. It is said to develop  $6\frac{1}{2}$  hp. with an air pressure of 50 to 75 lb. The weight of the hoist is only 285 lb. and the drum capacity 500 ft. of  $5/16$  rope wire. For raising the heavy bottom side sheets the hoist is clamped horizontally to the crosspiece of an A frame made up of 2 x 8-in. timbers, and single and double blocks are used. For raising the structural iron and roofing sheets a gin pole equipped with single and double blocks is employed, the hoist being clamped to a nearby tree, as shown in the illustration.

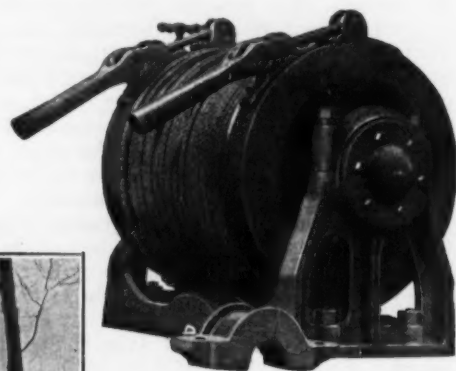
When raising the structural iron by hand it took a force of 20 men approximately three days to erect the framework. The same work is done in six hours by 13 men, using the air hoist. The roof is raised in six hours as compared to  $2\frac{1}{2}$  days by the former method.

The Iron Mongers' League of Boston held its first spring meeting Tuesday, May 8, at the Oakley Country Club, Watertown, Mass., on the invitation of J. O. Henshaw, J. O. Henshaw & Co., vice-president. Following luncheon, the members enjoyed golf.

### National Association of Sales Managers Organized

At a recent meeting held at the New York Advertising Club by a committee representing the New York Sales Managers' Club and the Sales Managers' Clubs of Philadelphia, Boston, St. Louis, Milwaukee, St. Paul and Columbus, it was decided to organize the National Association of Sales Managers, the first meeting to be held at Atlantic City, June 7, directly following the convention of the Associated Advertising Clubs of the World.

Membership in the association will be confined to sales managers, either as individuals or as a club membership. The object of the association is to secure for members, through fraternal cooperation, investigations and systematic interchange of ideas and information, the benefits of the best, most efficient and most eco-



One of the Eighteen 100-Ft. Steel Storage Tanks, the Erection Time of Which Was Reduced by More Efficient Handling of Material. An air hoist of the type shown above was clamped to a tree and used for raising the structural iron

nomical methods in the sale, marketing and distribution of merchandise.

Charles F. Abbott, 26 Madison Avenue, Montclair, N. J., was elected chairman. Mr. Abbott pointed out that sales managers have never had a national organization of their own, though they are entrusted with a responsibility in the sale and distribution of merchandise that should call for a constructive, cooperative effort directed toward the solution of some of the complicated problems involved. Sales managers throughout the country are invited to attend the first conference and further information may be obtained by addressing the chairman.

Examinations for technologist at \$2,800 to \$4,000 a year; associate technologist at \$2,000 to \$2,800 and assistant technologist at \$1,500 to \$2,000, are announced by the Civil Service Commission, Washington. Applicants may obtain full information and blanks from the commission in Washington or the secretary of the board of civil service examiners at the post office or custom house in any city. Subjects include rubber, leather, paper, textile, oil and metal enameling.

For compiling a catalog of brass goods, or for general distribution in their trade, William M. Webster, commissioner of the National Association of Brass Manufacturers, 139 North Clark Street, Chicago, has for sale to jobbers and manufacturers a quantity of the 1920 official catalog.



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*NEW and definite information as to the remarkable rôle which zirconium plays in steel metallurgy is revealed in the accompanying paper. The author read from manuscript this paper at the annual spring meeting of the American Electrochemical Society in New York May 5, at a symposium on rare metals. It came entirely unannounced, but it will be found to contain data of first importance. The work which it discusses was done by the research department of the Electro Metallurgical Co. of America, 30 East Forty-second Street, New York, of which Mr. Becket is the directing head.*

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## Some Effects of Zirconium in Steel

### Remarkable Effect on Rolling Properties in Presence of High Sulphur—A Deoxidizer and Scavenger— Rôle in Heat-Treated Steel

BY F. M. BECKET

THE title of this paper purposely expresses considerable limitation and implies brevity. At this time the principal object is to describe some of the specific effects of zirconium as determined in the course of an investigation which has involved 350 experimental heats of steel made for this particular purpose, since it is intended that a much more detailed discussion of the results will be presented in the near future, including descriptions of the procedures of the steel making, the physical testing, the metallographic studies and other phases of the work.

#### Early Work on Zirconium

Numerous experiments on the reduction of zirconium ores and the preparation of zirconium alloys were conducted at the Niagara Falls plant of the Electro Metallurgical Co. during the period of a few years immediately preceding the entry of the United States into the World War. These endeavors confirmed in a general way the published data relating to the properties of some of the zirconium compounds; but, more particularly, they developed a few important, unforeseen results which enables the author to relate much more closely than he had previously found possible the properties of zirconium and certain zirconium compounds to the properties of other more thoroughly understood refractory material.

Early in the year 1918, having been influenced by apparently authentic reports concerning the use by Germany of remarkable ordnance steels containing zirconium—reports which were later considered groundless, if the author has been correctly informed—the War Industries Board decided upon an intensive program of experimentation with zirconium in steel for light armor, the direct object being the earliest possible large-scale production, and the Electro Metallurgical Co. was requested to furnish zirconium alloys with this end in view.

A vast amount of energy was then expended in the way of comparatively large-scale experimentation on the production of a variety of zirconium alloys, and the Ford Motor Co. assiduously attacked the problem of zirconium steel with high ballistic qualities. At the date of the Armistice considerable tonnages of zirconium-silicon alloy were being shipped to designated steel companies for the purpose of large-scale manufacture, this particular alloy having been selected as the most efficacious after trial heats with many other zirconium alloys. As a result of the Armistice, the major portion of the alloy in these shipments did not find its way into the nickel-silicon steel for which it was intended. However, this additional experimentation on the production of zirconium alloys brought still more forcibly to the mind of the author certain peculiarities of zirconium.

The United States Navy also became interested in zirconium steels and requested the cooperation of the

Bureau of Mines and of the Bureau of Standards. According to H. W. Gillett and E. L. Mack in Bulletin 199 of Bureau of Mines, 1922, entitled "Experimental Production of Alloy Steels," production heats of a series of zirconium and other similar steels began in September, 1918. In this Bulletin are described fully the methods involved in making the experimental heats (50 lb.) of zirconium steel, and valuable information is contributed concerning the recoveries of zirconium obtained from several different zirconium alloys. Technologic Paper No. 207 of the Bureau of Standards, 1922, entitled "Manufacture and Properties of Steel Plates Containing Zirconium and Other Alloys," by G. K. Burgess and R. W. Woodward, reports in detail the properties of the zirconium steels made by the Bureau of Mines.

It is the author's understanding that as part of the zirconium phase of the investigations reported in the governmental papers just mentioned, it was greatly desired to determine whether the exceptional properties of some of the steels made under the direction of the Ford Motor Co. during the summer of 1918 could be properly attributed to zirconium. The conclusions drawn by the authors of Technologic Paper No. 207 are to the general effect that no particular enhancement of desirable physical characteristics is to be ascribed to zirconium, at least in the types of steel tested, and that the effects of this additional agent may be detrimental.

The foregoing statements have been made to explain that a tenacious enthusiasm for zirconium was the result of information acquired during the smelting of zirconium bearing materials, the production of various alloys of zirconium and the refining of some of these alloys. So impressed was the author in respect to certain properties of zirconium that an extensive program of experimentation on zirconium-treated steels was instituted and has since been continuously maintained with increasing encouragement. This program was launched with knowledge of the decidedly skeptical attitude the steel fraternity had acquired concerning the value of zirconium additions to steel in general and in particular the rôle of this element in the excellent steels that had occasionally been produced by the Ford Motor Co.

The practice followed in the steel heats of the present investigation have involved in the great majority of cases the melting of a 200 to 350-lb. charge of cold scrap-steel in a basic-lined electric furnace. Duplicate or triplicate ladles have been tapped from each heat in order to permit of a reliable comparison between the effect of the zirconium alloy addition and that of an equivalent addition of ordinary ferrosilicon. Whether rolled or forged, the ingots from any given heat have been treated identically so far as was possible during hot working, and all annealing, normalizing and heat-treating operations on the finished product

have been likewise conducted so as to insure strictly comparable results. The rolling and forging of the ingots have been performed under ordinary mill conditions by experienced operators.

#### Zirconium as a Deoxidizer and Scavenger

Zirconium has a greater affinity for oxygen than has silicon and, due to this fact, increased recoveries of silicon in the finished steel are obtained by the use of zirconium-silicon alloys. This greater recovery of silicon is quite marked when an alloy of 35 per cent zirconium is employed. For example, in a series of 40 heats of basic electric furnace steel an average silicon recovery of 98 per cent was realized, as compared with a recovery of 84 per cent for ordinary ferrosilicon added under identical conditions and in equivalent percentages of added silicon to duplicate ladles. This particular series resulted in a 56 per cent average recovery of zirconium, ladle additions of 0.15 per cent zirconium having been made in all cases.

The rate of the reducing action of zirconium on the impurities present in molten steel is not only more rapid than that of silicon, but zirconium is the more efficacious in removing the final traces of oxygen and nitrogen. This scavenging power of zirconium is demonstrated in the partial or complete elimination of the banded structure in rolled or forged products and in an increased rate of coagulation of emulsified slag. Zirconium-treated steels possess a cleanness which appears to be the result of a far more deep-seated action than characterizes the well-known deoxidizing and scavenging agents. There seems to be abundant experimental evidence to justify this assertion, but the relative brevity of this paper precludes a discussion of this side of the subject.

Brief reference may be made to the analytical evidence relating to the deoxidizing power of zirconium. By means of new methods of analysis developed by the Bureau of Standards for the determination of oxygen and nitrogen in steel, reliable data have been obtained in cooperation with the Bureau on four heats of steel treated with zirconium-silicon (0.15 per cent added Zr) and with ferrosilicon in duplicate ladles. The analyses show that the zirconium treatment eliminated from 12 to 84 per cent of the total oxygen present in the steel (including oxygen as FeO, MnO, SiO<sub>2</sub>, ZrO<sub>2</sub> and silicates), the average being 54 per cent. Or, expressed in another manner, the zirconium-treated steels showed a reduction in oxygen content of 54 per cent as compared with the steels treated with ordinary ferrosilicon. Analyses on another similar series of four heats gave 0.0035 per cent nitride nitrogen for the zirconium-treated steels as compared with 0.0072 per cent for the ferrosilicon-treated steels.

No indication of the occurrence of inclusions of zirconium oxide has been observed in the course of this investigation. All the evidence obtained points to the conclusion that oxidized zirconium forms with silica and oxide of manganese a fusible slag which quickly rises to the surface of the ladle. Analyses of ladle slags have confirmed this conclusion.

Minute, yellow, cubic crystals of zirconium nitride are generally observed in steels treated with zirconium in excess of approximately 0.10 per cent. They are strictly limited in number, and represent that residuum of the nitrogen content of the steel which was fixed by zirconium but not slagged off prior to solidification. These crystals as such do not exert a harmful effect on the steel; for instance, they were present in their usual amount in the heat-treated steels whose properties are mentioned later in this paper.

Fatigue tests to failure under rotary alternating stress have been made on 23 heats treated in duplicate ladles with zirconium-ferrosilicon (0.04 per cent added Zr) and 50 per cent ferrosilicon. The average effect of 0.04 per cent added zirconium has been an increase in the endurance limit by 1125 lb. per sq. in. This is particularly significant in view of the recognized detrimental effect of nonmetallic inclusions upon endurance limit.

#### Zirconium and Sulphur

When zirconium is added to steel in excess of approximately 0.15 per cent, this element assumes a new

rôle by chemically combining with sulphur to form an acid-insoluble compound not detected by means of the ordinary evolution method of analysis, and under any given set of operating conditions a linear relation exists between the percentage of sulphur thus fixed and the amount by which the added zirconium exceeds 0.15 per cent. It has been reasonably well established that for basic practice when the zirconium-silicon alloy is added in the ladle, every part by weight of zirconium added in excess of 0.15 per cent fixes 0.10 parts by weight of sulphur as an acid-insoluble, zirconium-sulphur compound. This chemical combination proceeds in as quantitative a degree when the steel contains normal sulphur and manganese contents as it does in those instances where the steel is sufficiently high in sulphur and low in manganese to give rise to an appreciable proportion of iron sulphide. In other words, zirconium has a greater affinity for sulphur than has manganese. The difference here in affinity favorable to zirconium is probably greater than the corresponding difference between manganese and iron.

A 5-ton acid open-hearth heat and a 10-ton basic electric furnace heat may be cited as examples of the influence of zirconium on sulphur as determined by the evolution method. In the former case an addition of 0.27 per cent zirconium as silicon-zirconium lowered the percentage of sulphur from an initial value of 0.040 per cent to a final value of 0.025 per cent, in the latter a 0.22 per cent addition of zirconium diminished the sulphur from 0.020 per cent to 0.009 per cent, leaving 0.15 per cent zirconium in the finished product.

Under favorable conditions the zirconium-sulphur compound may be actually eliminated from the steel by fairly heavy additions of zirconium-silicon alloy. Steels containing 0.08 per cent total sulphur have been reduced by ladle additions to a total sulphur of 0.048 per cent and a corresponding sulphur content of 0.037 per cent as determined by the evolution method. Actual desulphurization by zirconium is a field more limited and much less important commercially than the field covered by the effect of zirconium on the hot-rolling qualities of high sulphur steels now to be described.

In order to obtain the full beneficial effect upon hot-rolling properties, the zirconium alloy need be added only in amount sufficient to eliminate the iron sulphide constituent responsible for red-shortness. Ingots containing 0.185 to 0.200 per cent sulphur and only 0.15 per cent manganese have been rolled to plate and sheet free from cracks and seams when the steel had been treated with 0.22 per cent Zr. With steels containing sulphur up to 0.260 to 0.290 per cent similar results have been obtained by the addition of 0.43 per cent Zr. The untreated ingots of these steels have broken to pieces in every case on their first pass through the rolls.

#### Zirconium in Heat-Treated Steels

The beneficial effect of small additions of zirconium is strikingly demonstrated in the case of heat-treated, ordinary carbon steels. To illustrate, a heat of 0.70 per cent carbon steel was treated in one ladle with 0.15 per cent zirconium as a zirconium-silicon alloy and in the other ladle with an equivalent amount of ordinary ferrosilicon. After forging the ingots to 1-in. round bars, the following test data were obtained on the steels quenched from 825 deg. C. in water and drawn at the temperatures indicated. Standard S. A. E. specification for a much-used nickel (2.75 to 3.25 per cent)—chromium (0.60 to 0.95 per cent) steel are also tabulated for the purpose of comparison.

It may be observed from these figures that ordinary carbon steels in which a small percentage of zirconium has been incorporated may be made to possess by suitable heat-treatment physical characteristics approaching those of the highest grade, heat-treated alloy steels.

Additional experimentation has demonstrated that the properties of a number of the well-known alloy steels may be improved through the use of zirconium, and also that by zirconium treatment it is sometimes possible to use advantageously the ordinary alloying elements in less than normal proportions.

The author does not consider as relevant matter for this paper a discussion of the commercial aspects of zirconium in the manufacture of steel, nor does he wish



to engage in concrete prognostications. Therefore it must suffice here to state that several steel companies to whom zirconium alloys were introduced have taken

	0.70% Carbon, 0.15% Zirconium	0.70% Carbon Without Zirconium	S.A.E. No. 3450 Nickel- Chromium
Drawing temperature, deg. C.	375	375	.....
Per cent elongation.....	8.3	5.2	.....
Per cent reduction of area..	23.3	6.6	.....
Yield point, lb. per sq. in...	185,952	128,125	.....
Ultimate strength, lb. per sq. in. ....	227,203	197,800	.....
Izod number .....	7.5	7.5	.....
Brinell hardness .....	414	433	.....
Drawing temperature, deg. C.	412	412	427
Per cent elongation.....	12.7	7.5	12.5
Per cent reduction of area..	45.8	22.9	51.00
Yield point, lb. per sq. in...	172,620	180,180	175,000
Ultimate strength, lb. per sq. in. ....	198,828	207,144	200,000
Izod number .....	14.8	10.5	.....
Brinell hardness .....	407	418	.....

advantage regularly during the past two or three years of the excellent scavenging properties of zirconium. The effects of zirconium on phosphorus and sulphur

and in heat-treated steels have been drawn to the attention of a few steel manufacturers only within comparatively very recent period.

However, there appears to be reasonable justification for the optimistic comment, in conclusion, that in consideration of the specific effects herein mentioned and the experimental intimation of other effects now awaiting recognition, zirconium will probably contribute its fair share toward the progress of civilization through assistance to the steel and other metal industries.

The author wishes to acknowledge the cooperation of his associates, Alexander L. Feild, J. H. Critchett and J. A. Holladay. Mr. Feild has contributed many valuable suggestions and he has been throughout in immediate charge of the experimental steel manufacture and laboratory testing. Mr. Critchett by way of suggestion has rendered much assistance, especially in connection with the manufacture of zirconium alloys; and Mr. Holladay deserves much credit for original work on the quantitative determination of zirconium in ores and steels and for his supervision of the analytical work involved in this investigation.

Dial Indicator Gage for Small Parts

The dial indicator gage illustrated, for measuring and checking small parts 3/4 in. and under, is being marketed by the Federal Products Corporation, Providence.



Screw machine products, automobile parts, wire, watch material, screws, taps and other material may be measured readily. By substituting special convex anvil device the gage may be used for testing piston rings for both wall and radial thickness. A threaded collar and check nut on the end of the plunger at the top of the indicator hold the

plunger at any desired distance from the anvil, and as both the anvil and plunger have beveled edges, parts can be rapidly inserted.

An adjustable stop between the anvil and plunger can be set so that the part being measured will always rest in the center of the anvil and the plunger. By turning a knurled bezel the dial can be set to any desired position required in relation to the hand. The dial is graduated in 0.0005 in. and readings of 0.00025 can be taken. The gage is designated as model P.

President Campbell Optimistic

Commenting on business conditions, President James A. Campbell of the Youngstown Sheet & Tube Co., Youngstown, voices the belief that the iron and steel industry will enjoy favorable conditions throughout the year, and adds that there is nothing at present to cause apprehension beyond that time. He points out that the railroads, which are prospering, have bought heavily of the industry, contributing much to its prosperity.

"While the heaviest of their buying may be over for the present," he states, "still there are large unfilled orders from this source on steel makers' books, and they also have large unsatisfied needs."

April Automobile Production

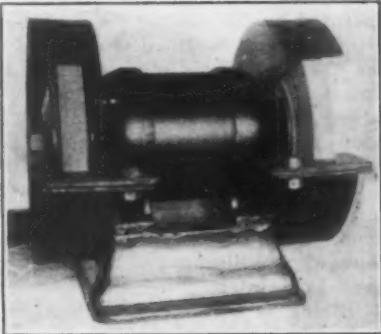
Total production of automobiles in April has been placed in preliminary figures of the National Automobile Chamber of Commerce at 364,000 cars. This is 3 per cent above the highest previous mark, which was 353,017 cars and trucks reported for March. The daily average output for April is thus 14,560, which is again a new record. *Automotive Industries* finds indications that May, with a greater number of working days, will go beyond the April performance.

For the first four months of the year the country's production is placed at 1,236,565 cars and trucks—a figure greater than the output for the entire year 1918, with 1,153,637 vehicles. The daily average for the first four months of the year was 12,219. This is larger than the entire production of the year 1903, when 11,000 cars were made. Even as recently as 1912 the total production was only 378,000 cars, which is not greatly above the production of April.

New Bench Grinder

A bench grinder with welded steel guards and tool rests, which are attached to the motor frame by four nuts that thread over the stud extension, has been placed on the market by Forbes & Myers, Worcester, Mass. The machine is known as Model No. 102 and absence from vibration is a feature emphasized.

The motor is of the squirrel cage induction type and is fully inclosed. The wheels are 10 by 1 in. and run at a speed of 1800 r.p.m., which is considered a safe and efficient speed for this size of wheel. Wheels of different grades and widths are available. The standard motor is for voltages of 220, 440, 550, and for 2 or 3 phase, 60 cycle current. Where 60 cycle current is not available a special motor may be furnished.



Public sale of the Modern Glass Co. will be held at the Court House, Toledo, Ohio, May 24, at 11 o'clock. The plant, located in Washington, Lucas County, Ohio, consists of 8 1/2 acres, two large buildings, one 180 x 365 ft., the other 90 x 408 ft., both steel and brick structures, and also two frame buildings and machine shop.

### Steam-Operated 10-Ton Crawler Crane

A steam-operated 10-ton crawler crane designated as the No. 2 and fitted with the necessary mechanism for hoisting on either of the two main drums or for operating a two line bucket has been placed on the market by the McMyler-Interstate Co., Cleveland. The mechanism is also capable of lowering and raising the boom, rotating the crane and traveling.

In addition to use in excavating and construction work, the crane may be employed to handle coal or bulk material, or with a lifting magnet, to handle iron or steel. The normal hoisting speed, single line full load is 200 ft. per min. and the maximum single line pull is 10,000 lb. The rotating speed is 5 r.p.m. and the traveling speed 100 ft. per min.

The various operations of the crane are actuated by a double cylinder, non-reversing steam engine. Right- and left-hand clutches are employed for raising and lowering the boom, for sluing and for propelling, link motions and reversing valves having been eliminated. A single lever controls each pair of clutches. The engine is mounted on the bed plate casting with the cylinder heads toward the boiler, an arrangement intended to permit a maximum ratio of connecting rod to crank throw, with minimum of vibration. The vertical tube boiler is 42 in. in diameter and 7 ft. high, has a heating area of 303 sq. ft. and is built for 125 lb. working pressure. For continuous service the boiler will generate 35 hp. A water tank and fuel bunker are provided.

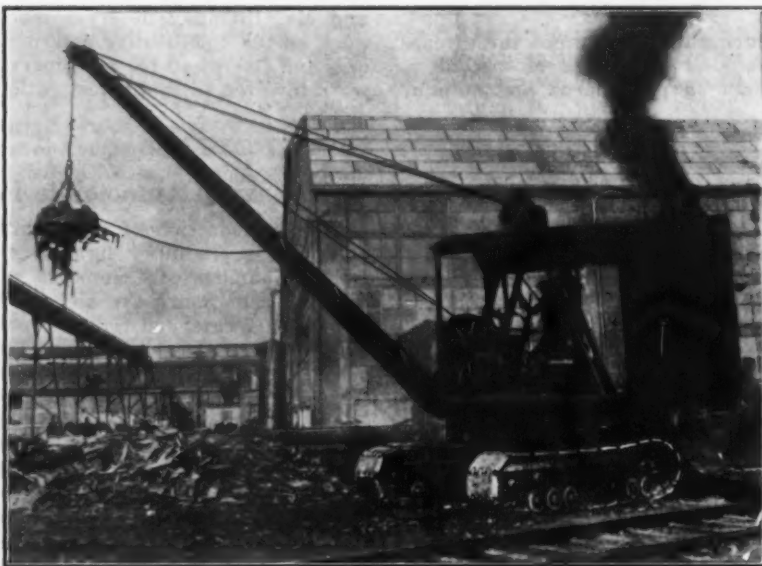
The two main hoist drums turn on a common drum shaft and are driven through large clutches housed in the outer ends of the drums. The clutches are operated by the company's double-screw thrust mechanism which is mounted on the end of the shaft toward the operator. This mechanism is designed so that the thrust produced in setting the clutches is self-contained within the shaft, no lateral thrust being thrown upon the supporting bearings. Each drum is fitted with a foot operated brake and the foot levers have a lock attachment. The boom hoist is mounted on the turntable casting at the rear of the hoisting mechanism. It is driven through a worm and gear, and is engaged and disengaged by means of a right- and left-hand jaw clutch.

Sluing is accomplished through the vertical sluing shaft which extends through the bed plate and engages its pinion with the circular sluing rack on the traveling base. Power is applied to the sluing shaft through right- and left-hand clutches which are operated by the company's end thrust device, being engaged and disengaged by a push-and-pull pin within the shaft. This pin is actuated by the end thrust device on the end of the shaft. The required end movement is obtained by a pair of eccentric trunnions. Positive release without the use of springs is a feature claimed, only slight pressure on the operating lever being necessary to swing the crane. The turntable or rotating base is a box-section steel casting. On the bottom of the turntable are mounted on machined pads the four conical steel turntable rollers. The bearing boxes with large bronze bushings are bolted to the machined pads. The rollers may be removed without jacking up.

Each crawler tread is an endless chain or belt made up of steel castings which travel over sprocket wheels at each end of the frame. The sprocket wheels and crawler tread castings are of patented design. The teeth of the sprocket wheels, which usually transmit power to the tread belt, are used only for guiding the crawler tread castings. Heels or lugs on both sides of each sprocket wheel engage with shoulders on the tread castings in driving the tread. This design is intended to assure delivery of full power to the tread, distributed uniformly over the entire face of the tread castings. Breakage of sprocket wheel teeth is said to be eliminated, accurate alignment assured and jumping the sprocket wheel teeth prevented. The inner faces of the tread castings form a track on which ride eight steel rollers or wheels turning in bearings mounted on the bottom of the crawler frame. The idler sprocket wheel bearing boxes may be moved longitudinally by

adjusting screws to take up any slack which may develop in the crawler treads.

When traveling a straight course, two jaw clutches engaging the crawler sprocket wheels are held in engagement by means of a compression spring. The crane is steered by temporarily withdrawing the power from the crawler side toward which the machine is to be directed. Full power is available in driving the live crawler during the period of swinging. The crane may be steered in either direction at



Attachments for Operating Drag Line Bucket, Magnet and Shovel Are Available. Accessibility for adjustment and repair and steering from cab are features

will regardless of the relative position of the boom and car body. Steering is by the crane operator from his cab, and without assistance from a ground man.

### Stocks of Chicago Foundries

A canvass of 125 different foundries in the Chicago district has been completed by a pig iron broker and shows that stocks in melters' yards or under contract are not excessive. Seven foundries reported less than one month's supply of pig iron on hand or contracted for; 19 reported less than two months' supply; 36 less than three months' supply; 28 less than four months' supply; 18 less than five months' supply and 17 less than six months' supply.

Reconstruction of the blast furnace at Sharpsville, Pa., of the Sharpsville Furnace Co. has been completed by the William B. Pollock Co., fabricating interest of Youngstown. It is expected to start the rebuilt stack about June 1. Capacity of the furnace was increased from 200 to 350 tons daily, and modern machinery and an ore trestle installed.

Robert C. Barton, formerly Pittsburgh district sales agent, Brier Hill Steel Co., has opened an office at 1607 Commonwealth building, Pittsburgh, to do a general agency business in iron and steel.

The Gary Tube Co. has placed an order with the Chapman Engineering Co., Mt. Vernon, Ohio, for 28 Chapman automatic gas producers. These are for the tube plant which this company is building at Gary, Ind.



# American Electrochemical Society

## Notable Paper on Zirconium in Steel Read at Forty-third General Meeting—Symposium on Rare Metals— Molybdenum in Steel Discussed

**A**NOTHER record for notable contributions to metallurgy was made by the American Electrochemical Society last week. It was the occasion of the society's forty-third general meeting in New York at the Commodore Hotel, May 3 to 5, under the auspices of the local New York section. This convention is better known as the annual spring meeting.

The society has held several important symposiums in the past, such as the one on ferroalloys, at Boston

a few years ago, the one on the corrosion of iron and steel at Atlantic City in the spring of 1921, the one on electric furnace cast iron at Baltimore in April, 1922, and the one on electrical industrial heating last September at Montreal, all of which were discussed in *THE IRON AGE* at the time. In each case something new or striking has been a feature of those sessions. On each occasion there have been also important metallurgical papers delivered at the other more general sessions.

## Symposium on Production and Use of Rare Metals

**T**HE feature of the convention last week was the symposium on the general subject, "Production and Application of the Rarer Metals." The contributions were obtained by Dr. F. M. Becket, Carbide & Carbon Co., 30 East Forty-second Street, New York, who presided at the meeting Saturday morning, May 5. Part of Doctor Becket's duties is the direction of the research of the Electro Metallurgical Co. of America. It is no exaggeration to say that some of the information divulged was of an epoch-making nature. The attendance, which was large, was enthusiastic and participated actively in the discussion, only the leading points of which can be touched on here.

### New Light on Zirconium in Steel

What amounted almost to a sensation was the unannounced presentation of a paper by the chairman, Doctor Becket, who designated it as a brief recital of some work which was being done by the research department of his company under his direction. Its publicity was released by the company's board of directors for presentation at this symposium. Dealing with an exhaustive investigation of the effect of zirconium, it was read from manuscript and of course was not preprinted. It presents some revolutionary results, which were announced for the first time, outlining briefly several definite effects from the use of a silicon-zirconium alloy in the production of steels of various kinds, among which may be mentioned its scavenging and desulphurizing properties, as well as a remarkable effect which it has on the rolling properties of steel, when the actual sulphur content is high. Doctor Becket also presented some highly interesting results of the effect of the zirconium on certain heat-treated steels as compared with other alloy steels not treated with zirconium. The paper practically in full is printed elsewhere in this issue.

Calling attention to the fact that the society was to be congratulated on being able to spread upon its records so important a contribution and emphasizing that the facts brought out were of a revolutionary nature, E. F. Cone, New York, asked if it is possible to learn the composition of the alloy which is used in thus treating steel. Doctor Becket, in reply said that the composition varied, depending largely upon the amount of silicon which it was desired to incorporate in or prevent from entering the steel. For these reasons the alloy varied running anywhere from 10 to 35 or 40 per cent zirconium and from 40 to 60 or 70 per cent silicon. It is known as a silicon-zirconium alloy.

### Address on the Rarest Metals

The session was opened with an address on the "Present Status of the Production of Rarer Metals," by Prof. C. James, University of New Hampshire, Durham, N. H., stating that many years ago at a lecture at London University, his interest had been aroused in the

subject of rarer metals. As a result he had been led to devote most of his time to their investigation. The paper was a most interesting contribution to the latest developments in the separation by quantitative analysis or by commercial processes of such metals as tantalum, columbium, the rare earth like cerium, thorium, germanium, beryllium, gallium, indium, uranium and zirconium.

In discussing these metals, Professor James stated that some of them had been neglected because they were too rare and hence considered useless but in several cases, where uses had been found for them, larger sources of supply had been developed so that, as in the case of thorium, some are being produced on a large scale. One of the most interesting statements was the search for germanium which the author is particularly interested in. It has unusual applications in medicine and the speaker stated that in a most unusual way he had heard that in South Africa there was a copper mineral which carried germanium. Learning that there were huge amounts of this mineral, he had succeeded in securing some of it and had found that it contained 7 per cent of this rare metal. The mineral is known as germanite. Several interesting applications of it were also mentioned, particularly its ability to alloy with copper.

### Rare Metals in Steel

One of the important papers of this symposium was entitled "Experiments with Rare Metal Steels, Using Uranium, Boron, Titanium, Zirconium, Cerium and Molybdenum," by Dr. H. W. Gillett and E. L. Mack, Bureau of Mines, Ithaca, N. Y. Characterizing this contribution as more or less a piece of patch work, Doctor Gillett, who presented an abstract, dealt briefly first with uranium and its segregation in steel, stating that not much is known yet concerning the effects upon steel, although it bestows certain strengthening properties and has a hardening action. As a scavenger, however, he considered it of little consequence.

After briefly discussing boron and titanium, the author recalled the fact that zirconium had at one time been heralded as a wonderful factor in steel-making, and discussed some of the results of its use in high silicon nickel steels, and that in steels where certain percentages of zirconium, silicon and titanium were present, there seemed to be very little difference in properties, even when the total amount of these elements present were regarded simply as silicon, and that the zirconium seemed to have very little effect, the steel being as good without as with.

Discussing cerium, Doctor Gillett called attention to the peculiar property that when over 1.50 per cent was introduced into steel, there was detected a distinct odor of sulphurous acid, and that in some cases it was demonstrable that nearly half of the sulphur was removed. That this element sometimes acts as a desulphurizer appears to be evident, but this is true only

when at least 1.50 per cent is used. At the same time, however, there is the formation of oxide and other non-metallic inclusions which are easily detected among the crystals of the steel, so much so that cerium does not appear to improve the properties appreciably.

#### Importance of Molybdenum in Steel

The conclusion of Doctor Gillett's paper, constituting the larger proportion of it, is a discussion of molybdenum in steel. Stating that the investigation of the previous elements had shown very little of advantage in the improvement of steel, the author was emphatic in his statement that molybdenum does accomplish something. He designates it as a "real alloying element and more potent in its effect than any other element, except possibly carbon." He called attention to the air-hardening properties, particularly the depth thereof, which molybdenum bestows upon steel, and then spoke of the changes which it brings about in the critical range, a role which vanadium does not play. In other words, molybdenum exercises a splitting or lowering of the critical point of steels. A martensitic condition is therefore more easily possible as a result of air cooling. He also stated that the effect of molybdenum was more potent in the presence of other alloys than otherwise and that in fact air quenching in the presence of molybdenum was equal to water quenching in the case of many other steels. The fact that molybdenum increases the hardening power seems to render the martensite more sluggish and hence the steel is harder to draw. He believed that the presence of molybdenum in steel combines good strength with extra good ductility.

The discussion was opened by Bradley Stoughton, consulting engineer, New York. Characterizing the paper as valuable and interesting, he stated that light was thrown on two important matters, segregation and sonims. The latter, whether small or large, are responsible for the difference between clean and so-called dirty steel. He believed that there were two grades of steel—good and super-excellent. Reciting that for years crucible steel was the only steel which was really super-excellent, he discussed the attempts of the electric furnace steel producers to produce a product to take its place, and asserted that in many cases much harm had been done and that steel of a quality equal to crucible had often not been made.

Referring to the fact that very good steels are possible by the acid open-hearth process, particularly, and by some other process, Mr. Stoughton then took up alloy steels. He characterized many of the steels discussed by Dr. Gillett as not at all alloy steels but really alloy-treated steels, and advised that the title of the paper be modified. In his opinion steel containing molybdenum is not an alloy steel and the same could be said of vanadium, which is largely a scavenger in his opinion. He called attention to the possibility of obtaining practically pure iron known as electrolytic iron, which in its original state has a tensile strength of about 38,000 lb. per sq. in., and when rolled a tensile strength of about 90,000 lb. per sq. in. He felt that a study of the effect of alloying elements upon such a product was well worth while. These are only a few of the points which Mr. Stoughton quite liberally discussed.

#### What Are Alloy Steels?

That an exceedingly important point had been brought out by the previous speaker was called attention to by Edwin F. Cone, THE IRON AGE, New York. The fact that Mr. Stoughton had stated that there was a difference between alloy steels proper and alloy-treated steels seemed to call for some sharp definition as to just what an alloy steel is. Citing the statement of the previous speaker that manganese steel was only an alloy steel when it contained 12 to 14 per cent manganese, Mr. Cone brought up the fact that during the war and since there has been made considerable steel containing about 1.25 per cent manganese, the properties of which both as rails and forgings, as well as castings, were excellent. He also cited the fact that plain carbon vanadium steel was now being made for heavy forgings for locomotives on a fairly large scale

and also that a steel for structural purposes was being more widely used which contains about 1 per cent manganese and about 0.25 per cent silicon. According to the statements of Mr. Stoughton, these steels would not be properly called alloy steels. Other cases of a similar nature could easily be cited. The speaker stated also that alloy steels of all kinds had grown to such proportions that some accurate definition or line of demarkation should be drawn to avoid confusion, although it was his understanding that generally alloy steels were those which contained elements or metals in a larger proportion than was usually found in simple carbon steels.

Doctor St. John, research laboratories, Carbide & Carbon Co., Long Island City, N. Y., suggested that where the crystal structure of a steel is decidedly changed by the addition of an element, such steel might be considered an alloy steel, but where the metal which is added acted more or less as a scavenger or remained in the shape of sonims, such a steel might be called an alloy-treated steel, but even in these cases the fact that molybdenum units with carbon to form a molybdenum carbide with unusual properties was cited as offering objections to such a proposed classification.

Mr. Stoughton, in closing the discussion, offered the suggestion that it would be well to have a committee formed to settle upon some definition and expressed the opinion that additions of alloying elements to steel did not really form an alloy steel, unless somewhat revolutionary properties were bestowed upon it.

#### Effect of Alloying Elements in Steel

The last paper of this symposium having direct relation to the steel industry was entitled "Inherent Effect of Alloying Elements in Steel," which was delivered in abstract by the author, Dr. B. D. Saklatwalla, general superintendent Vanadium Corporation of America, Bridgeville, Pa. Dr. Saklatwalla's presentation was a scholarly discussion on the importance of the effect of alloying elements on the purely physical changes occurring among the constituents of steel. He laid stress on the necessity of a study of the physical conditions and their alterations by alloying elements during the period of solidification and drew attention to the importance of the effect of alloying elements on surface tension of the solidifying constituents. The possibility of coordination and equivalence among alloy elements based on the periodic system, especially with reference to the atomic volume, was also discussed.

#### Uranium and Other Metals

Following this paper was one entitled "Preparation of Metallic Uranium," by R. W. Moore, General Electric Co., Schenectady, N. Y., which described a method for the preparation of metallic uranium in a very pure state and also a method of fusing the metal to form buttons or small pigs which may be rolled down in the form of thin sheets.

The symposium also contained three papers on the platinum group entitled "The Preparation of Platinum-Rhodium Alloy for Thermocouples," by R. P. Neville; "Investigation of Platinum Metals at the Bureau of Standards," by Edward Wichers and Louis Jordan, and one entitled "Some Notes on the Metals of the Platinum Group," by F. E. Carter.

#### Other Technical Sessions

At the technical session, Friday morning, May 4, papers were presented covering miscellaneous subjects. The first two were entitled "Heat Insulating Material for Electrically Heated Apparatus," by J. C. Woodson, electric heating engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, and "Methods of Handling Materials in the Electric Furnace and the Best Type of Furnace to Use," by Frank W. Brooke, chief engineer, William Swindell & Bros., Pittsburgh. These two papers were presented in abstract but not in printed form at the annual fall meeting of the society at Montreal. An abstract and discussion of both papers were published in THE IRON AGE, Sept. 28, 1922, in connection with the account of the proceedings of that



meeting. Last week these papers were available in printed form and were brought up for discussion. Mr. Woodson presented his in abstract but, in the absence of Mr. Brooke, his paper was abstracted by Dr. Colin G. Fink. There was some discussion, but most of it was a repetition of the points brought up at Montreal.

#### Gray Iron from Tin Plate Scrap

The paper entitled "Electric Furnace Detinning and Production of Synthetic Gray Iron from Tin Plate Scrap," by C. E. Williams, C. E. Sims and C. A. Newhall, all of Seattle, Wash., was presented in abstract by Mr. Williams. Mr. Williams and Mr. Sims are metallurgist and electrometallurgist respectively of the Northwest Experiment Station, U. S. Bureau of Mines, and Mr. Newhall is with the Washington Electrochemical Co. An abstract of the paper is as follows:

Experiments were conducted in a small electric furnace in which tin-plate scrap was melted with various addition agents in attempts to remove the tin from the iron. Sodium chloride, iron sulphide and an oxidizing slag were used under various conditions. The conclusions reached were as follows:

1. It is impossible to remove most of the tin in tin-plate scrap or similar material by any of the electric furnace melting processes tried; moreover, it is impractical to attempt any detinning by these means.
2. No tin is volatilized, ordinarily, when iron scrap containing it is melted in the electric furnace.
3. The amount of tin volatilized during melting in the cupola may be as much as 50 per cent in some cases, whereas in others it may be practically nil, depending upon the amount of surface of metallic tin exposed, and the oxidizing condition of the blast.
4. Lead can be removed completely from iron coated with lead, and likewise zinc can be largely removed from galvanized scrap by melting in the electric furnace.
5. A tin content of 1 per cent or less does not seriously affect the physical properties of cast iron.
6. Under conditions prevailing in many parts of the country, tin-plate scrap and used tin cans cannot be profitably treated by any of the established detinning processes. This potential waste material can probably be recovered most usefully and efficiently by treating it in the electric furnace to produce synthetic cast iron, using low grade, tin-free scrap for dilution to reduce the tin content of the product to within safe limits.

In opening the discussion of this paper, Doctor Fink suggested that besides the methods dealt with in the paper for removing the tin some attention should be paid to the use of magnesium silicate as to its efficacy as a slag. From his experience it has been found that this silicate has a strong affinity for tin, with not so much effect upon the iron. He suggested an investigation as to the relative solubility of iron and tin in various slags. His own investigations on the treatment of Bolivian tin ores has shown some interesting results.

E. L. Crosby, Detroit Electric Furnace Co., Detroit, suggested that this whole question depended largely upon the law of supply and demand. He had reference particularly to the supply of tin cans and stated that frequently when a cheap scrap is available and a plant is established for using such material after the operations had been started the cost advances because of the growing scarcity of the material, such as scrap, and profits are correspondingly diminished.

Mr. Williams, in replying, indicated that he believed that the slag possibility to be remote so far as the removal of tin is concerned, because the tin is dissolved in the metallic iron.

#### Cobalt and Its Uses

At this session an interesting paper entitled "Cobalt, Its Production and Uses," by C. W. Drury, professor of metallurgical research, Queen's University, Kingston, Ont., was presented in abstract by Doctor Fink. The paper contains an account of the occurrence of cobalt ores and deals briefly with the metallurgy of the production of the metal, and then describes the uses. Among the latter are mentioned its role in the manufacture of stellite and the fact that it is one of the main constituents of permanent magnets. The statement is made that the addition of cobalt permits magnets to be made of less than half the weight of

those made of ordinary tungsten magnet steel. The use of the oxide for coloring in the ceramic and in the enamel industries was cited, and the paper concluded with the statement that unless some extensive cobalt deposits are found the source of the metal is limited.

#### Chromizing—A New Process

Following this paper there was presented by F. C. Kelly, research laboratory, General Electric Co., Schenectady, N. Y., a new and exceedingly interesting development under the title "Chromizing." This new process is analagous to calorizing and sherardizing, which involves respectively the introduction of aluminum or zinc at temperatures above the ordinary into the surface of iron, forming more or less of a superficial alloy or covering.

The author describes the work which has been done to date upon the diffusion of metals in the solid state and also the details of the process of calorizing, including its effects upon the physical and chemical properties of iron or steel. The practical application of this process is also considered. A summary of the literature is included and there are also several photomicrographs showing the structure of the chromized iron at various temperatures and under various con-



A. T. Hinckley, the new president of the American Electrochemical Society, has long been identified with its activities. He is associated with the National Carbon Co., Niagara Falls, which is part of the Carbide & Carbon Co., New York

ditions. The contact process is dealt with as well as the effect of carbon and various chromizing data are included. The effect of heat treatment is discussed and the physical characteristics of chromized iron are given somewhat in detail. The author discusses the chromizing of other metals, besides iron, such as nickel, molybdenum and tungsten.

The author concludes by stating that chromizing may be used for another purpose than protection from corrosion, such as the prevention of the flow of a metal like copper on iron at a temperature above the melting point of copper. Stating that this is an interesting field of research, he adds that there are indications that there may be future developments and applications for metals treated by the diffusion process.

#### Business and General Session

The annual business meeting of the society and its various divisions was held at 2:30 p. m., Thursday, May 3. The secretary read the results of the letter ballot for new officers for the ensuing year as follows:

President, A. T. Hinckley, chief chemist National Carbon Co., Niagara Falls, N. Y.

Vice-Presidents, Laurence Addicks, consulting engineer, New York; George K. Elliott, chief metallurgist, Lunkenheimer Co., Cincinnati, and Henry Howard, Grasselli Chemical Co., Cleveland.

Managers, F. M. Becket, Electrometallurgical Co. of America, New York; C. B. Gibson, Westinghouse Electric & Mfg. Co., East Pittsburgh, and R. A. Witherpoon, vice-president and general manager Canada Carbide Co., Ltd., Shawinigan Falls, Quebec.

Dr. Colin G. Fink, Columbia University, New York, was re-elected secretary and F. A. Lidbury, works manager Oldbury Electrochemical Co., Niagara Falls, was re-elected treasurer.

The announcement was made that the board of directors had elected to honorary membership Dr. Edward G. Acheson, the founder of the Acheson Graphite Co., Niagara Falls, N. Y. Dr. Acheson was escorted to the stage by Dr. Carl Hering, consulting electrical engineer, Philadelphia. At this point, F. A. J. Fitzgerald, Fitzgerald Laboratories, Niagara Falls, read a paper entitled "E. G. Acheson and His Work." This address was a tribute to the work of Doctor Acheson, the discoverer of Acheson graphite, to his work in creating the artificial abrasive industry and to his efforts in developing "siloxicon." The speaker also called attention to the fact that Doctor Acheson fully recognized the importance of basing his work on fundamental scientific principles. Stress was also laid upon his work in the development of methods for producing a nearly chemically pure non-coalescing graphite for lubrication, which should act as a substitute for oil. Doctor Acheson expressed in a very gracious manner his appreciation of the honors conferred upon him.

#### Electrochemistry Abroad

Following this, Carl G. Schluederberg, the retiring president, delivered his annual address, entitled "Opportunities of the American Electrochemist Abroad." Mr. Schluederberg has just returned from an extensive trip in Japan and China, and last fall he concluded a similar trip into Peru, Chile, the Argentine and Brazil. His address, which will be found abstracted elsewhere in this issue, discusses the present applications of electricity from hydroelectric power as applied in the countries referred and gives several striking examples of

the production of pig iron, steel, ferroalloys and other materials, particularly in Brazil and Japan.

#### Fall Meeting at Dayton

Announcement was made that the fall meeting of the society would be held in Dayton, Ohio, Sept. 13, 14 and 15. A feature of that meeting will be a symposium on advances in the electrolytic refining of metals, particularly tin, lead and nickel. There have been some radical changes recently in the methods for the electric refining of nickel, according to a statement by Secretary Fink. Another feature of the fall meeting will be an informal roundtable discussion on the general topic of the electric furnace brass foundry practice. Another symposium will deal with the electrochemistry of conduction in gaseous mediums for which 18 papers are already promised.

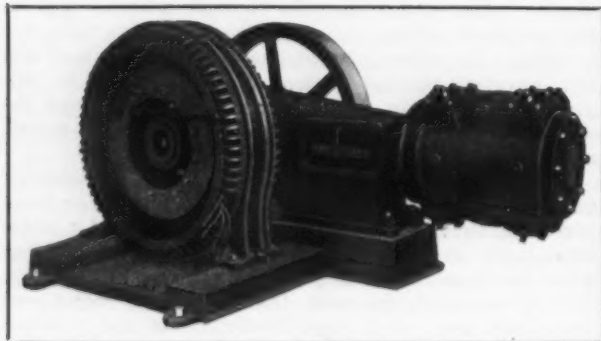
At a meeting Thursday afternoon of the electrothermic division of the society, the following officers were chosen: Chairman, George K. Elliott, Cincinnati; vice-chairman, Dorsey A. Lyon, Bureau of Mines, Washington; secretary-treasurer, Acheson Smith, Acheson Graphite Co., Niagara Falls, and F. M. Becket and Bradley Stoughton, New York, members at large for two years.

The total registration was over 250, which is a large gathering for this organization. It exceeded those in attendance at Montreal and Baltimore, the last two meetings. The principal social event was a trip to Westport, Conn., Friday noon, at the invitation of the Dorr Co. Lunch, dinner, golf and an evening of dancing filled the time.

#### New Motor Driven Air Compressor

A new direct-connected air compressor unit, driven by a synchronous type motor has been placed on the market by the Pennsylvania Pump & Compressor Co., Easton, Pa. Compactness is a feature. The new units are available in sizes up to 600 cu. ft. per min., both single and two stage.

The machine illustrated is of 10 in. diameter by 9 in. stroke with a piston displacement of 240 cu. ft. free air per min. It is direct connected to a 40 hp.



Air Compressor Driven by Synchronous Type Motor

synchronous motor, running at 300 r.p.m. The motor, manufactured by the Electric Machinery Mfg. Co., Minneapolis, Minn., is mounted upon the end of the crankshaft replacing the usual belt wheel. The crankshaft with the rotor on one end and the fly wheel on the other end is carried in the two main bearings of the compressor.

The motors are controlled by a special switchboard which is designed to eliminate difficulty in starting the synchronous motor. Control is by a single push button mounted on the switchboard. Pressing the button starts the motor in the usual manner and when up to speed the synchronous element is cut in automatically. The compressor may be fitted with a pressure control which automatically stops and starts the motor as the air pressure rises and falls. The benefit to the power factor available with a synchronous motor operating under partial load, is said to make it desirable to run the motor continuously and control the air by means of the usual pressure controller.

#### Band Saw with Built-in Motor Drive

A new feature of the No. 16 band sawing machine of the Oliver Machinery Co., Grand Rapids, Mich., is the "motor-on-shaft" drive, wherein the motor is mounted directly on the lower wheel shaft of the machine.

The motor is keyed to the lower wheel shaft which runs in two ball bearings supported by the two end bells. The latter have finished concentric tongues which fit inside of the finished rings of the band saw frame and on the stator, a construction intended to assure alinement and accessibility. The motor is fully inclosed. An air gap extending up into the column is designed to provide for sufficient circulation of air to keep the motor cool. The new drive is recommended when 600 r.p.m. two or three phase alternating current motors can be used.

The machine will take 36 in. between the blade and column, and 16 in. under the guide. The table is 36 x 30 in., 40 in. high, and tilts 45 deg. to the right and 5 deg. to the left. The machine is equipped with an auxiliary table which is 19 x 23 in., and saw blades from 17 ft. 5 in. to 19 ft. 3 in. long and from 1/8 to 2 1/2 in. wide may be used. The wheels are 36 in. in diameter, 2 in. wide, fitted with rubber band facing and secured to the wheel shafts on taper bearings by a hexagonal nut. The upper wheel has a vertical adjustment of 12 in. and may be tilted for tracking the blade. Other types of motor drive, including the company's "attached belted motor drive," are available and a belt driven unit also.

Mark Fenton, vice-president and general manager of the New Industries Co., Youngstown, Ohio, will be one of the speakers May 24 at the Industrial and Chamber of Commerce secretaries convention, to be held at Memphis, Tenn. His subject will be "Industrial Development."

The Pennsylvania Railroad will spend \$500,000 in extensions and betterments at its Mingo Junction, Ohio, yards. Beside laying much track, plans call for a new track scale, a car repair shop, machine shop and a 50,000-gal. water tank.



# Electrometallurgy in Foreign Countries

## Pig Iron and Steel Operations in Brazil—Japan Making Iron, Steel and Ferroalloys Electrically—Possibilities in Other Countries

BY CARL G. SCHLUEDERBERG

**B**RAZIL, rich in mineral resources and with great quantities of waterpower distributed over her vast area, offers much in the way of opportunity to the electrochemist. He will find here great beds of rich iron ore, immense deposits of manganese, vast stores of the rarer metals and elements so widely used in the industries, fluxes and reducing agents in the form of charcoal from the rapidly maturing eucalyptus tree, and waterpower in abundance near the sea coast and existing centers of civilization, many of them already developed with power lines extending over wide stretches of territory.

### Pig Iron and Steel in Brazil

The most important electrochemical development is that of the Brazilian Electrometallurgical Co. at Ribeirao Preto, where two 30-ton electric pig iron furnaces have been erected, together with two 6-ton Bessemer converters for the direct conversion of the iron into steel, as well as a Ludlum 6-ton electric steel furnace for the treatment of such steel as may be received from the Bessemer converters and require special doctoring in order to bring it up to the desired composition. In addition, there are rolling mills for plates and shapes, reheating furnaces and the necessary auxiliaries.

Recent reports from this operation indicate that so far the plant has worked only on scrap metal, with some pig iron, which is melted in the Ludlum steel furnace. They have rolled as much as 20 tons of round and square bars per day, which have been offered at prices 10 per cent below quotations on similar foreign material. Owing to the railroad not having been completed to the iron ore mine, no ore has yet come in, and hence reduction operations have not commenced. It is reported that the company has been able to book enough business to keep the plant busy for the next year or more.

Whereas on the west coast of South America practically all electrochemical and electrometallurgical processes and operations are carried on by Americans or Europeans, on the east coast, as in Brazil, this work is being carried on and financed in a large measure by Brazilians, although even here the apparatus, of American or European manufacture, so far has generally been installed by American or European engineers.

A second plant for the electric-cupola reduction of the local deposits of iron ore on a much larger scale is under active consideration in this same district, and it is reported that the rather large financing required

is being carried out successfully and that steel rails will be the principal product.

### Charcoal from Eucalyptus Trees

With abundant cheap power readily available from the numerous waterfalls and plentiful deposits of iron ore of an excellent grade, as well as manganese and other necessary alloys and fluxes, and a local market for pig iron and steel products, the only material thing which seems to stand in the way of Brazil's becoming a considerable producer of iron and steel products seems to be the question of a suitable reducing agent such as coal or coke. Here it becomes necessary to substitute charcoal, usually obtained from eucalyptus trees which mature within five years in this tropical climate and the wood of which, planted in large numbers, regularly serves as fuel for railroads and industrial plants. The fact that, in the electric cupola, carbon is consumed only in proportion to the amount of ore reduced, and that it does not have to serve the dual purpose of both fuel and reducing agent, is a factor of no mean importance where only such an expensive form of carbon is readily obtainable.

Outside of possibly a few electric furnaces for foundry use, the foregoing covers electrolytic and electrothermal activities in six of the principal countries of the South American Continent.

### Electric Pig Iron and Ferroalloys in Japan

Turning to the Far East, we find one country at least with a development along lines approaching our own or that of Europe—Japan—rich in waterpowers, many of them already developed on a large scale, high-tension transmission lines everywhere, and the one idea in the minds of all her 60,000,000 people of emulating Western civilization and making industrial progress as rapidly as possible; willing also to sacrifice almost every other consideration to this end. This assimilation of Western civilization, started not more than two generations ago, has attained results to date which command our admiration.

The war gave an impetus to the industries of Japan as to those of other countries; the ones already in existence increased and many others. Electrochemical and electrothermal came into being, these including the manufacture of soda, chlorate, carbide, ferroalloys, pure pig iron, electrolytic zinc, copper, etc., along with others. But just as in other countries, some of them since the war have had difficulty in maintaining their existence. Today general business in Japan, while quiet, is improving, but many of her electrochemical in-

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**T**HE author of this paper, who is associated with the Westinghouse Electric & Mfg. Co., Pittsburgh, just recently returned from an extended trip to China, Japan and the Philippines, and last fall made a similar trip to South American countries. His object was to investigate water power possibilities and the opportunities for the American electrochemist in those countries. Retiring as president of the American Electrochemical Society last week, Mr. Schluederberg, in his annual address, entitled "Opportunities for the American Electrochemist Abroad," gave the results of his observation on the two trips referred to. An abstract of this address appears on these pages, but only those portions are reproduced which refer to the iron and steel industry. The author in the original address dealt at length with the electrochemical developments in Peru and Bolivia, particularly with the operations of the Chile Exploration Co. in its large electrolytic refining plant for copper. The possibilities as to tin, silver and vanadium were also touched upon, and the entire address dealt extensively with the water power possibilities of those countries.

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That Japan is determined to keep to the fore in electrochemical development is evidenced not only by what she has already done in her industries but also by the training given her young electrochemists in the various courses on electrochemistry forming part of the regular curriculum of her universities and by the amount of attention given electrochemical subjects in the local engineering and scientific journals and also by the fact that, of all foreign countries, Japan is best represented in the American Electrochemical Society which numbers in its membership about 75 Japanese residing in Japan, as well as many others residing in this and other countries.

#### Situation in China

China, in spite of her 400,000,000 people and most ancient of civilizations, at the present time offers but little if any opportunity to the electrochemist. Although both rich coal and iron deposits exist and fairly modern blast furnaces and steel plants are available for turning out pig iron and finished shapes and rails, there has been practically no electric-furnace development, and electrochemistry, except as applied in a few small plating shops and possibly in the new mint in Shanghai, is an unknown quantity.

There is but little waterpower available or developed throughout the vast alluvial plain forming the eastern-central part, or great middle kingdom of China. In one or two of the more important coast cities electric furnaces have begun to be used in the foundries and shops of the larger companies. At Hongkong, in a steel foundry, a 2-ton furnace of one of the better-known makes has given an excellent account of itself, albeit hand regulation of electrodes by Chinese labor, melting from cold scrap, has caused considerable conversation between the central station and foundry managers, with instructions from the former to the latter to keep off the line during peak hours.

Disturbed political conditions, instability of the republican form of government due to the absolute unpreparedness of the mass of the people for self-government, maintenance of separate armies by the various provincial governors in their endeavor to hold individual power, as well as a few other disturbing factors, are at present militating against industrial, economic, scientific and all other progress. This condition applies even in South China in the province of Yunnan, far famed for its wealth of tin, copper, zinc and other ores and water-power. The immediate prospects of either electrochemical or electric-furnace developments in China are not encouraging.

Nor in Indo-China, the northern part of which, bordering as it does on Yunnan, is rich in both coal and mineral deposits, are there any evidences of electrochemical developments having been undertaken by the French, although here, as in the Malay Peninsula, the problem of the reduction of tin is ever present.

Certainly the Yunnan Province of China, Northern Indo-China, and the Malay Peninsula offer an interesting field for the electrochemist who is not afraid to go and remain abroad amid living conditions radically different from those existing in the United States.

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with binders and a testing machine whereby the qualities of the binders can be determined. It was pointed out that the drying of cores in general practice is needlessly slow and that drying could be accomplished more rapidly with higher temperature. The faster the drying, however, the more careful the oven operator must be. The limits of time and temperature which may be used in drying can be accurately determined by the testing machine.

Progress reports were presented for the committee on refractories, the committee on heat treatment of ferrous castings and the committee on phosphorus and sulphur in steel.

Mr. Jameson, speaking for the committee on specifications for steel castings, reported that the subcommittee on specifications for steel castings of the American Society for Testing Materials on which the American Foundrymen's Association had representation, had reported specifications to the A. S. T. M. committee on steel which would submit them to that association as a whole. He also made reference to the new Federal specification and stated that his committee had suggested a few changes which would bring them more into conformity with the proposed A. S. T. M. standards.

The other session on steel foundry subjects convened Monday afternoon, April 30, and was presided over by C. S. Koch. None of the papers delivered at this session was available in printed form and, therefore, the speakers presented their subjects from partly prepared manuscripts or extemporaneously. Most of these, however, will be available later in printed form. Each paper was rather liberally illustrated with lantern slides.

#### Microscopic Study of Steel Molding Sands

A paper originally scheduled for this session, entitled "Operation of Basic Electric Furnaces," by M. W. Caruthers, Westinghouse Electric & Mfg. Co., East Pittsburgh, was withdrawn from the program because of inability of the author to prepare it. In its place there was presented a paper by Prof. H. W. Dieter, University of Illinois, Urbana, Ill., entitled "The Application of the Microscope and the Camera to the Study of Steel Molding Sands." This was an interesting exposition of the application of rays of light to specimens of sand so that a photomicrograph of the effect of the various rays as they hit the grains of sand is produced from which it is claimed possible to judge certain qualities of the sand for molding purposes. In the apparatus as used, certain rays of light pass into the microscope and camera and others pass entirely out of this field and the resultant effects are said to be of considerable practical value.

#### Light Army Tractor Steel Castings

One of the most interesting papers presented at this session was entitled "The Production of Light Steel Castings for Ordnance Work," by Major Minton, United States Ordnance Department, Watertown Arsenal, Watertown, Mass. The speaker stated that the title of the paper was somewhat misleading as it dealt only with the production of links and grousers for army tractors. The former is a casting which averages about 50 lb. and the latter are much lighter at 9½ to 10 lb. each.

A presentation of the physical and chemical properties which these castings are to meet was given substantially as follows: The links must have a tensile strength of 80,000 lb. per sq. in., with an elastic limit of 36,000 lb. per sq. in., with an elongation and reduc-

tion of area of 15 and 50 per cent respectively. The grousers are required to have a tensile strength of 60,000 lb. and an elastic limit of 27,000 lb. per sq. in., with an elongation and reduction of area of 22 and 30 per cent respectively. The chemical composition of the links is made to meet a range of 0.35 to 0.45 per cent carbon, 0.50 to 0.80 per cent manganese, 0.15 to 0.35 silicon, while for the grousers the corresponding range is 0.20 to 0.30 per cent carbon, 0.40 to 0.70 per cent manganese and 0.15 to 0.35 per cent silicon, with a maximum for sulphur and phosphorus in both cases, 0.05 per cent. About 8000 castings had been made in wooden flasks up to the time that the flasks had been obliged to be discarded and the output ranges about 100 to 140 castings per day per man.

#### Their Heat Treatment

The heat treatment of these castings was stated to be as follows: They are brought up to about 900 deg. C., from which they are quenched in water for 15 sec. and then drawn at 700 deg. C. The author gave the following as representative heats as to chemical and physical properties for the two classes of castings: Links C., 0.40; Mn., 0.57; Si., 0.31; Ph., 0.039; S., 0.021 per cent; elastic limit, 53,000, and tensile strength, 91,000 lb. per sq. in.; elong., 15 per cent; red. of area, 20.5 per cent. Grousers C., 0.26; Mn., 0.46; Si., 0.21; Ph., 0.032; S., 0.024 per cent; elastic limit, 46,000, and tensile strength, 71,000 lb. per sq. in.; elong., 25 per cent; red. of area, 37 per cent.

Major Minton stated that the steel for these castings is made in a 2-ton electric furnace with an acid bottom. It is the practice to use the scrap obtained from the 6-ton basic furnace which is also operated in that plant. It was the author's opinion that for the thin section of the castings referred to the best steel was obtainable from the acid electric furnace when operated under proper conditions.

In response to one of the two questions, the author stated that no definite data were available as to the exact tapping temperature, but admitted that it was possible to obtain a metal which was too hot; also the fact was brought out that in his experience there had been no sign of wild heats.

At the conclusion of the presentation of this paper Major Minton had thrown on the screen some of the results obtained at his plant from the use of the X-ray in examining castings of this nature. Some interesting radiographs were presented, showing the sensitiveness of this method of testing and its ability to detect blow holes, inclusions, etc.

A. D. Williams, Cleveland, Ohio, gave a brief talk on the subject of "Heat Generation in Open-Hearth Practice," which was illustrated by numerous charts thrown on the screen and which brought out the relative merits of various kinds of fuel and some of the principals governing their application.

#### McConway Centrifugal Process

Considerable interest was aroused in the presentation of the McConway process for the centrifugal casting of steel, which was described in THE IRON AGE, Feb. 1, 1923. Besides lantern slides showing the principle upon which the machine is constructed and other important features, Harvey Allen of the McConway & Torley Co., Pittsburgh, who brought the subject before the meeting, displayed a moving picture of the process in operation commercially.

The report of the committee on specifications for steel castings was presented by A. H. Jameson, chairman, who reviewed the subject by request at the Thursday steel session as already mentioned.

## New Developments in the Foundry Industry

A GROUP of papers especially intended to bring out new developments in foundry practice and metallurgy was arranged for a session held Wednesday afternoon, May 2. The centrifugal casting of iron and steel was represented by papers by specialists in these fields. Dr. Richard Moldenke offered papers on desulphurizing compounds and on a new way to make

long life molds. This session was well attended and was presided over by Alfred E. Howell, general manager Somerville Stove Works, Somerville, N. J.

#### Centrifugally Cast Piston Rings

The centrifugal casting of iron piston rings was described by John A. Rathbone, foundry engineer, Detroit, Mich. The greatest difficulty encountered was



the chilling of iron which necessitated annealing. Annealing in turn caused the carbon to precipitate as temper carbon. This was overcome by using cores completely surrounding the casting. The precipitation of carbon in the temper carbon form, while disadvantageous in the case of piston rings, proved suitable for casting large pipe nipples. Economy in making castings by the centrifugal method, the author stated, is entirely dependent upon the diameter of the castings and the cost of replacing the molds. Below diameters of from 2 to 3 in., more castings can be produced in a snap flask than a man can pour off in a revolving head, but above 2 or 3 in. the centrifugal method is practicable. In figuring costs, the life of a mold must be taken into consideration.

The mold used in the DeLavaud centrifugal process of casting iron pipe stands up only for about 3000 castings, Doctor Moldenke pointed out in the discussion. He said that no metal in a mold will stand up unless it is faced with a refractory material having properties similar to a sand mold. It is a mistake, he asserted, to try to increase the life of the mold by using stronger iron.

Leon Cammen, New York, offered the comment that what Doctor Moldenke said about permanent molds only held true of molds made of ordinary materials which are subjected alternately to sharp and wide variations in temperature. The same cannot be said of molds made of alloy steel subjected to heat control.

#### Casting Steel Centrifugally

Mr. Cammen then discussed at length his own paper on "Centrifugal Casting," in which he traced the history of the process and its practical application up to the present time, and outlined its possibilities. He explained the mechanics of centrifugal casting on horizontal, vertical and inclined axes respectively, and touched upon the temperature of mold surfaces, comparing warm molds, water-cooled and hot molds. Cast iron projected against a water-cooled mold, he said, gives a highly degrephitized metal, or a hard, brittle white iron. By proper annealing this can be converted into gray iron of high strength and, in fact, tests have shown that centrifugally cast iron pipe is on an average at least 20 per cent stronger than sand cast pipe. The practicability of the process, however, depends entirely upon the cost of annealing. He expressed the opinion that, with present methods of annealing the waste in castings might be as much as 15 per cent, which would tend to offset the economies of the centrifugal process.

Great interest was manifested in that part of Mr. Cammen's address which dealt with the method which he himself has devised for hot-mold centrifugal casting. This process, he asserted, makes possible the production of thin sections 3/16 in. and up in considerable lengths and in comparatively small diameters. A molten metal, he pointed out, will spread in exactly the same way as oil or mercury, provided it stays liquid long enough, but the trouble with the majority of metals is that they are poured at temperatures only a little above the melting point and therefore chill with extreme rapidity. To obviate this, the mold may be heated to a high temperature, which in this case means approximately 1700 deg. Fahr. for steel or monel metal, 1500 deg. for brass, 1200 deg. for aluminum, and so on. When steel is poured against a mold having a temperature of 1700 or 1800 deg. it does not cool instantly, as it would in contact with a cold mold. In fact, it has been found that a 3/16-in. wall takes about 45 sec. to harden completely, which is sufficient to produce clean metal.

The temperature of the metal at pouring must be closely watched and the machine must be properly designed and constructed, he continued. The foundation and all parts of the machinery must be ample from the point of view of strength and rigidity. Cast iron cannot be used for hot molds because in centrifugal casting very high stresses are induced mechanically and especially thermally, and the combination of the two makes the use of cast iron dangerous and uncertain. Steel pipe may be used with safety and will last fairly long. Where a clay-lined mold is used, how-

ever, at least 5 per cent of the surface of the clay lining should be drilled out in small holes to permit the gases generated in the core under the action of the molten metal to escape.

When the metal comes in direct contact with the mold in warm or water-cooled molds there is no objection to the use of ordinary steel from the point of view of safety, but there is danger that the life of the mold will be very short, said Mr. Cammen. Therefore nichrome, steel or Becket metal analyzing 0.50 per cent carbon, 26 to 28 per cent chromium, 0.40 to 0.60 per cent silicon and 0.60 per cent manganese, may be used. Becket metal is most suitable for the hot molds. It is essential that there be no blow holes within 1/4 in. from the surface of a hot mold and that the molds be absolutely smooth. In fact, for the best results the surface of a hot mold should be lapped as smooth as glass. The mold thickness must have a certain relationship to the size of the casting. The mold must be thick enough so that it will not be heated above the critical temperature which in the case of nichrome is about 2300 deg. Fahr. Nichrome cannot be used for tubular castings because it expands and grips the casting.

He suggested the following formulae to determine the proper speed of the rotation of the molds for different metals: Taking R as the radius of the casting in inches, the speed of rotation when casting iron is

$$\text{equal to } \frac{1550}{\sqrt{R}}; \text{ for steel, } \frac{1350}{\sqrt{R}}; \text{ for bronze, } \frac{1675}{\sqrt{R}}; \text{ for aluminum, duralumin, etc., } \frac{2250}{\sqrt{R}}.$$

When asked why lead-copper alloys centrifugally cast often show a banded structure, he replied that it was due to the fact that the metals had not been thoroughly mixed and was overcome by casting the metals as cold as possible.

In reply to another question Mr. Cammen admitted that trouble was encountered with the warping of molds. Warping of solid molds can be prevented by a proper design of heating furnace. If the mold is not enveloped in a uniform heat in the furnace it will warp right there, he pointed out. The principal trouble with warping is with split molds which, of course, must be used for tubular work.

The patent situation, according to the author, should be investigated by any one wishing to consider centrifugal casting, as the basic features in design are now free to everyone. There are a number of patents on minor improvements, however, which are still valid.

#### Molds With Long Life

A "New Long-Life Mold Development" was the subject of a paper presented by Doctor Moldenke. This was published practically in full in THE IRON AGE, May 3.

#### Desulphurizing Cast Iron

Doctor Moldenke also discussed a new development when he presented his paper, "The Desulphurization of Cast Iron." One of the most serious problems confronting the foundryman today, he pointed out, is the constantly increasing sulphur content in the scrap metal available for melting. In 1890 the average percentage of sulphur in iron was 0.05, whereas today it ranges from 0.14 to 0.18. Although it has long been known that the application of soda or potash on the clean surface of molten cast iron will remove considerable of the sulphur contained therein, it remained for Richard Walter, Düsseldorf, Germany, to make that application practical. A test which Doctor Moldenke observed abroad showed a reduction in sulphur in the ladle from 0.14 per cent to 0.095 per cent, or 32 per cent.

In developing the method Walter found that the chief objection to the use of soda ash on molten iron was that it took too long to melt. Even compressed cakes of soda ash melted slowly because the air films between the individual grains of soda served as insulators, impeding the transmission of heat through the

mass. The first detail solved by Walter was to melt the soda base to remove all these air films and thus get cakes which would melt very rapidly when thrown on the molten iron. It was also found necessary to thoroughly clean the surface of the molten iron from slag floating on it before the reaction would take place. The silica in the slag would unite with the alkali so that the sulphur in the molten iron would not be affected. It was therefore found necessary to skim off the top of the ladle of molten iron very carefully before the desulphurizer cakes were thrown in.

It was also found essential to keep the ladles clean, he said, and most important to make iron which would not have more slag coming to the surface after the skimming. Observations have shown that only the liquid slag of the iron is to be feared, as the ladle lining itself is attacked so little in the short time involved that contact with the brick and the daubing is negligible. The practice of throwing a handful of sand on the clean surface of the metal should be especially avoided, as it will immediately vitiate the effect of the soda. The removal of the thin slag formed on the surface of the metal after the application of the soda is accomplished by scattering a highly refractory absorbent material upon the thin slag, which serves to solidify it and make its removal easy. The best material for this purpose is air-slacked lime. About a cigar box full of lime is required for a ton of metal. The desulphurizing process may be repeated over and

over again so long as the iron is still sufficiently hot.

The reaction of the desulphurizer placed on the surface of the metal in the ladle extends promptly throughout the whole mass, he pointed out. Samples for analysis have been repeatedly taken from the top, middle and bottom of the ladle of desulphurized iron and practically identical amounts of sulphur have been found. The usual time for the contact of the desulphurizer with the metal is from  $2\frac{1}{2}$  to 4 min., depending upon the temperature available.

Leon Cammen, in discussing Doctor Moldenke's presentation, remarked that the reaction of the soda ash on the metal is selective and that, while it will attack sulphur first if the sulphur content is too small, it will then remove silicon. Doctor Moldenke pointed out that the process was so new that its full possibilities are unknown and suggested that members of the association conduct experiments in desulphurization during the coming year.

A paper on "British Foundry Practice—Ferrous and Non-Ferrous," by Dr. Percy Longmuir, Sheffield, England, was read by R. S. MacPherran, Allis-Chalmers Mfg. Co., West Allis, Wis. This paper is one of a series on foundry problems which are being exchanged between the Institution of British Foundrymen and the American Foundrymen's Association. Dr. Longmuir summarized the outstanding recent developments in British ferrous and non-ferrous foundry practice. The paper will be abstracted in THE IRON AGE May 17.

## Papers on Electric Furnace Gray Iron

ONE of the sessions Tuesday morning, May 1, was devoted largely to papers discussing the application of the electric furnace to the gray iron foundry and kindred subjects. It was wrongly designated a general session, which somewhat detracted from the attendance. Electric cast iron is a subject which recently has not been discussed at foundry conventions and this session was designed to focus attention on this important phase of foundry work. The chairman of this meeting was L. L. Anthes, Anthes Foundry, Ltd., Toronto, Ont., and a former president of the association.

### Production and Cost of Electric Gray Iron

The subject of electric gray iron was brought before the meeting by two papers, one entitled "Gray Cast Iron from the Point of View of the Electric Furnace" by George K. Elliott, chief metallurgist Lunkenheimer Co., Cincinnati, and another entitled, "Electric Furnace from the Manager's Viewpoint" by L. F. Barton, foundry manager, Dibert, Bancroft & Ross, Ltd., New Orleans, La.

Mr. Elliott who is recognized as the first authority to have called attention to the possibilities of the electric furnace as applied to the gray iron foundry and who contributed the first international exchange paper from this country, which was presented at the meeting of the Institution of British Foundrymen a year ago, delivered his paper in person. In the absence of Mr. Barton, who was unable to be present, the paper was presented in abstract by Edwin F. Cone, THE IRON AGE, New York. Both papers were discussed liberally.

The paper by Mr. Elliott treats of the main features underlying the operation of acid and basic electric furnaces and then discusses the effects of each method of operation upon the principal elements in cast iron, drawing at the same time a comparison with the effects obtained by means of the cupola. The author closes his paper with the discussion of two or three problems that have been introduced into the metallurgy of the iron foundry because of the introduction of the electric furnace for melting or treating cast iron. One of the problems referred to was a discussion as to the true effect of sulphur upon the

mechanical properties of gray cast iron and the other was a plea for methods of mechanical testing of cast iron. The author stated that present standard tests for gray iron in his opinion are sadly lacking in scope and variety and not equal to the task of detecting the more latent virtues of different varieties of iron. It is the hope of the writer to see the introduction of tests of a more dynamic nature because he believes that this may reveal shades of difference in cast irons to which the customary tests are not sensitive.

### The Problem of Cost

The paper by Mr. Barton was a contribution to the discussion as to whether the electric furnace for producing iron castings is an economical proposition. The discussion was based entirely upon the experience of one company, and for that reason is specific rather than general. The author compares an analysis of production costs of cast iron made by the electric furnace and that made by the cupola, and he states that under local conditions it has been found that melting costs were such that competition by the cupola with the electric furnace is possible in that district. This comparison is given in the paper in detail figures.

The author also called attention to the added advantage of the electric furnace in that both steel and iron can be melted, thus making possible a variety of output, as well as a general tonnage. The governing point in a study of the costs of the acid and electric processes is, according to the author, the difference between conversion costs and the price of suitable melting stock. While the discussion in the paper is illustrative of the conditions as found by the writer in one locality, it may be that conditions in another locality are adverse to the successful operation of an electric furnace for iron castings. However, concludes the author, if one is assured of a steady tonnage sufficient to keep in continuous operation an electric furnace of from 2 to 4 tons capacity, he advises that it is to the advantage of a foundryman to look thoroughly into the situation, because what may appear on the surface may not follow as a fact when all points are considered.

In the discussion which followed, Dwight Miller, Milwaukee Electric Railway & Light Co., Milwaukee, asked Mr. Elliott whether a superior cast iron is possible from an acid furnace, even when poor quality



scrap is used and whether it could not be made at much less cost than in the cupola. Mr. Elliott, in replying to this, said that from his experience it was not cheaper to make gray iron castings in an electric furnace even with good scrap and that he had never contended that the electric furnace could compete with the cupola unless possibly when pig iron is very high. Of course, high grade castings can be made in the basic electric furnace, but in any event, much depends upon just what is meant by high grade castings. When it comes to a question of competing with the cupola on ordinary grades of iron, the electric furnace is out of the running under ordinary conditions, he declared.

#### Melting Cast Iron Turnings

The question of the melting of cast iron turnings in an electric furnace was brought out by Colonel McAvey, St. Johns, New Brunswick, who said that in his experience they were easy to reduce, if done under proper conditions. Mr. Elliott, however, insisted that they are always hard to melt and that it is by no means an economical proposition.

F. J. Ryan, F. J. Ryan & Co., Philadelphia, testified that in his electric furnace experience the melting of turnings is not serious if the proper proportion is used, say 30 to 40 per cent of the total charge.

W. B. Wallis, president, Pittsburgh Electric Furnace Co., Pittsburgh, in discussing the question as to whether the electric furnace can compete with the cupola, stated that local conditions vary, and that in some localities it is entirely possible for the electric furnace to be used advantageously. He called attention to the fact that in one foundry in which bottle molds were now being made by electric furnace cast iron, the molds were found to have five to seven times the life of the same product when made from the cupola, and that in such a case, the question of cost does not enter.

Touching on the point in Mr. Barton's paper as to the advantage of the electric furnace for either cast iron or steel operation, Mr. Elliott stated that, while this was true, there were disadvantages involved which from his experience were sometimes serious. In such

interchangeable operation, he said that gray iron was often left in the furnace and this sometimes seriously interfered with operations on steel and that the same was true when gray iron was made after a heat of steel.

#### Quality as Important as Cost

That too much importance is often attached to figures in some particular locality was the contention of F. J. Ryan, who expressed the opinion that the production of cast iron in the electric furnace is at present going through the same phase through which steel went in the earlier days. While the question of cost is important, the higher return or yield is also of vital consideration. He did not believe that the general average of cost was lower than the cupola, but that improvements in the quality of cast iron was not only acknowledged but of growing importance. He advocated the solicitation for future conventions of papers dealing more with quality of electric cast iron than with some other phases of the subject. Recognizing the importance of this suggestion, the chairman urged that a resolution be passed by those present, embodying Mr. Ryan's idea. Later, such a resolution was presented and carried as written by Mr. Ryan.

E. F. Cone, THE IRON AGE, New York, called attention to the fact that the electric furnace for cast iron was important not only as to quality, but also as to its future rôle in the production of alloy iron castings, the growing demand for which would probably be considerable. It is probable that only the electric furnace will be efficient enough to produce uniform castings of this character.

#### Film of Centrifugal Casting of Iron Pipe

An interesting feature of this session was the presentation of a moving picture, prepared for the United States Cast Iron Pipe & Foundry Co., showing the two processes of making cast iron pipe at its plant at Birmingham, Ala. The first part represents the old or sand mold method. The last portion of the picture gives a vivid reproduction of the application of the De Lavaud centrifugal process as adapted to the production of pipe. At Birmingham four centrifugal machines have been operating nearly a year.

## Papers on Malleable and Gray Iron

A MALLEABLE session was held Wednesday afternoon during which five papers were presented. H. A. Schwartz, chief metallurgist National Malleable Castings Co., Cleveland, presided at this meeting.

#### Heat-Treated Malleable Castings

The first paper was on "Hardened and Tempered Malleable Castings" and was prepared by E. K. Smith, Lakeside Malleable Castings Co., Racine, Wis., and read by E. J. Lowry, Hickman, Williams & Co., Chicago. The paper showed that because of the recent demand for medium grade tools intermediate between the 10 cent variety and the high grade steel hardware, an investigation was conducted to determine the possibilities of hardening malleable casting tools. Various methods were tried out and the resulting properties of the metal were studied. While the experiments were not carried to a definite conclusion they showed that there are great possibilities for further investigations. The experiments were conducted with a view of determining the feasibility of hardening malleable iron parts, the nature of the hardened product and the processes best adapted to hardening. A number of malleable bars were heated to various temperatures and quenched and the metal then was extremely hard and in many cases had a fine grained, gray fracture resembling steel. Hard white iron was drilled with a twist drill made of this material.

In order to determine the usefulness of hardened malleable under ordinary shop conditions a number of hammer heads were made which failed to develop flaws after three months' hard service. Several hundred samples of various shapes were hardened in various ways to determine the best methods. For quick work

the ordinary blacksmith forge gave good results. Warm water was found best for quenching. Hardness readings on 100 samples varied from 40 to 55 scleroscope, which was regarded as a satisfactory range for this tool. No particular attempt was made to arrive at cost, but it seemed probable that hardened malleable could be produced and finished at less cost than steel.

A number of test bars were heat treated and the results of these tests were embodied in the paper together with microphotographs of the samples. The results were obtained with iron of various compositions, the general hard iron analysis averaging about 1.05 per cent silicon, 0.056 per cent sulphur, 0.14 per cent phosphorus, 0.27 per cent manganese and 2.40 per cent total carbon. The author stated that the experimental data showed a field for research and probably for commercial processes. By proper heat treatment a desired portion of the carbon may be recombined, giving a metal of the required hardness.

A slightly more complex heat treatment would produce a moderately hard, very strong material, such as one of the samples which had 94,844 lb. per sq. in. ultimate strength, 78,664 lb. elastic limit with 7.5 per cent elongation. Among the possible uses of wholly or partly hardened malleable castings mentioned were the following: Castings with a part sufficiently heated to undergo great shocks while the bulk must be soft and tough, such as an ordinary claw hammer; castings requiring a great deal of machine work which can be done first, then hardened, such as machine parts; castings that require a smooth surface, or where light sections are used, such as certain articles of cutlery and hardware requiring tough handles and hard cutting surface; castings a part of which must resist a

file, such as automobile locks, part of which must be tough and hard.

#### Continuous Muffle Annealing Furnace

A paper on "The Adaptation of the Continuous Muffle Annealing Furnace to the Malleable Iron Industry" was presented by Philip Dressler, American Dressler Tunnel Kilns, Inc., Cleveland. The author first discussed the control of the temperature curve in the continuous tunnel furnace for securing best results in annealing malleable castings. Lantern slide showed the construction, operation and control of the furnace. Details were given as to how the process of heating and cooling can be kept under complete control.

Mr. Dressler said that the International Harvester Co. is now operating a tunnel furnace on the basis of 15 cars per 24 hr., giving a cycle of 96 hr. In reply to questions, he said that coal could not be used with this type of furnace because the ash would clog up the combustion chambers.

#### Malleable Castings in Small Quantities

"Malleable Iron Cast in Small Quantities" was the subject of a paper by S. J. Felton, Ohio Mechanic's Institute, Cincinnati. This dealt primarily with the melting of malleable iron in furnaces not in ordinary use for this metal. It can be melted in brass foundry crucible furnaces, but the small quantities produced and the difficulty of obtaining sufficiently high temperatures usually make this method impracticable. High grade free annealing malleable iron can be melted in 500 to 1000 lb. horizontal barrel type non-crucible tilting furnaces, using oil as a fuel. This iron can be annealed without difficulties.

The paper devoted considerable attention to the electric furnace for melting malleable iron. The writer said that the arc-electric furnace seemed to be ideal for melting malleable but foundrymen should go slow on this medium until more research has been done to cut down annealing time. Annealing difficulties had been encountered with iron melted in the arc-electric furnace, but the writer had had no experience with malleable iron in induction furnaces.

In the discussion the author said that the high temperature of the electric furnace either directly or indirectly affects the metal and that foundrymen using the electric furnace are likely to encounter considerable difficulty. The statement was made that iron melted in electric furnaces should anneal in the same time required for annealing after melting in a combustion furnace, but that this does not prove true, longer time being required.

#### Checking Malleable Scrap

E. D. Halsey, Terre Haute Malleable & Mfg. Co., Terre Haute, Ind., presented a paper on "Checking Malleable Foundry Scrap." The author described the method in use at his plant to control the amount of scrap. A committee composed of superintendent, assistant superintendent, production manager and foreman daily inspect the rejections and propose ways and means to salvage castings and correct defective methods. The figures showing rejections for each plant are posted for the information of the molders and a competitive spirit is aroused. It was felt that the work accomplished by the committee more than offsets the time lost by the foreman.

#### Fuel Oil for the Air Furnace

"The Application of Fuel Oil to the Malleable Air Furnace" was discussed by A. V. Landschoot, Iowa Malleable Iron Co., Fairfield, Iowa. He said that fuel oil has been tried for several years by various concerns with widely varying degrees of success. He described the furnace construction and methods of operation which have been successful. One high pressure burner is used and the oil is atomized by steam pressure. Air under low pressure is admitted into the furnace through a 14-in. pipe below the burner. The top blast arrangement in use is the important pivot upon which the main essentials of successful operation are balanced. The loss and gain elements in melting were considered and tables given.

It was pointed out that among the outstanding advantages of oil firing are the uniformity of operation and the ability to produce the desired composition as soon as the iron has attained the proper pouring temperature. Carbon is considered the most unruly element. The writer discussed repairs and refractories and described a special type of bung frame. He favored several small heats per day instead of one large heat. In conclusion, he said that the following are outstanding features in connection with the use of fuel oil for melting iron: The necessity of proper combustion and heat control, control of charge and elements through desired oxidation to insure uniformity of product, control of the element of time, economy of repair, labor and materials in furnace maintenance, and elimination to a considerable extent of the human element in furnace operation.

Considerable discussion followed the paper. Scott McKay, Stowell Co., Racine, Wis., said that his company had used oil for melting for two years. The troubles that they had met at first were with oxidation. The question was asked whether those who used oil fired furnaces were really satisfied with the results obtained from the use of oil as compared with gas coal outside of the improvements in the metal. Several who had used oil for fuel seemed satisfied with the results. G. W. Neely, Lewis Foundry & Machine Co., Pittsburgh, stated that his company is using oil fired furnaces for melting iron for chilled rolls and had been told that if they would reduce the oil consumption to 55 gal. per ton of metal there would be a saving over coal. They had been able to do away with five men on three furnaces and had eliminated the cost of handling coal. From the point of view of the shop he thought they were saving money by using oil, but the office records showed otherwise.

Mr. Landschoot estimated a 25 per cent saving in fuel cost at his plant by using oil instead of coal. Mr. McKay said that he was sold on the use of oil and called attention to the various factors that should be taken into consideration, such as having the heat poured on time, decrease in shop scrap, and avoidance of shop dissatisfaction caused by delays. With fuel oil there would always be hot metal on time. Mr. Neely stated that one of their furnaces has run 84 heats without being rebuilt and the other two were rebuilt after the seventy-second and seventy-third heat.

#### Reports on Specifications

The committee on specifications for malleable castings reported that the recommendations regarding dimensions of tensile test bars and an increase in the tensile requirements contained in a previous report were placed in effect by the American Society of Testing Materials at its last June meeting. In this tentative specification the ultimate strength has been raised from 45,000 to 50,000 lb. per sq. in., the elongation from 7.50 to 10 per cent in 2 in., and the tensile bar shortened from 12 to 7½ in. The report was accepted and will go to the board of directors for action.

#### Papers on Gray Iron

H. B. Swan, Cadillac Motor Car Co., Detroit, opened the gray iron session on Thursday morning, at which A. O. Backert, Penton Publishing Co., Cleveland, presided, with a paper, "Notes on Gray Iron for Automotive Castings." Data discussed in this paper were obtained from replies to a questionnaire sent to about 25 automotive casting plants, to which about 16 sent in replies, a number of which were incomplete in the answers to questions asked. However, a table giving data on iron mixtures and cupola practice in producing cylinders, pistons, crank cases and miscellaneous small castings was possible.

#### Automotive Castings of Iron

The author reviewed the effects of carbon and other elements upon the physical properties of automotive castings, pointing out that in cylinder blocs and heads, since the desideratum is wearing qualities and hardness before strength, there was a need of high total



carbon. Sulphur was necessary to hold the hardness of the casting, the speaker stated, indicating 10 to 15 points as the desirable range. In piston castings a mix low in phosphorus prevented shrinkages. Mr. Swan argued that good castings, free from draws and shrinks, called for at least 40 per cent iron in the mix. The speaker also commented upon the lack of standard cupola practice and of tuyere ratios.

Discussion of the paper converged largely on carbon, its control and relation to the fuel used. It was urged that the height of the tuyeres had much to do with the total carbon content of the melt; also that the speed of melting and the quality and structure of the coke were important influences. Doctor Moldenke pointed out that the steel in the mix drew carbon from the fuel. C. E. Sims, Seattle station, Bureau of Mines, reviewed experiments conducted at that station in synthetic iron. These were mostly in electric furnaces, but in those conducted in a cupola the fuel was retort carbon. It was developed that silicon up to about 2 per cent in the mix retarded the absorption of carbon, but above that point there was no variation other than reduced solubility. The presence of manganese increased the carbon. Another speaker suggested that as dense coke means high carbon, there should be an investigation of the kinds of coal being used to make coke. This brought a rejoinder from Doctor Moldenke that what was desired was coke which will burn in the cupola instead of the stack, drawing attention to a recent article by Doctor Koppers in *THE IRON AGE* on the subject. It was Doctor Moldenke's idea that the temperatures at which the coke was made might lead to a solution of the fuel question. He contended that coal coked at 2200 deg. Fahr. for the cupola would make possible a melting ratio of 17 lb. of iron to 1 lb. of coke.

#### Specifications for Gray Iron

E. J. Lowry, Hickman, Williams & Co., secretary, committee on specifications for gray iron castings, presented a report on the deliberations of the committee on May 2. The committee, which considered specifications for an international test bar and for the purchase of pig iron, had the assistance by invitation of Doctor Moldenke and Walter Wood, Camden Iron Works. A letter from Secretary Shaw, Institution of British Foundrymen, was presented which stated that this organization had adopted a test bar 1.2 in. in diameter and 18 in. long, and that it had been arranged to ask acceptance of this bar at the annual convention of the British Foundrymen, June 13 next.

It was agreed that there was a need of an international test bar, the report of Mr. Lowry stated; that the present Association of Testing Materials bar was not satisfactory for a comparison of strength; that a motion to adopt an international test bar be adopted; also that as the A. S. T. M. bar is not acceptable under present conditions, the members of the A. S. T. M. committee now on the American Foundrymen's Association committee be empowered to act with the A. S. T. M. committee in determining the proper test bar. A motion by R. S. MacPherran that any specifications adopted should include a statement that the test bar represents the quality of the iron and not the casting itself was adopted, as was also a recommendation by Mr. MacPherran that research be conducted to compare the present test bars with the Fremont-Porter test

#### Buying Pig Iron by Specifications

Under the subject of specifications for the purchase of pig iron, the committee approved a recommendation, suggesting to committee A-3, American Society for Testing Materials, that it recasts the standard specifications for the purchase of pig iron (Specification A-43-22-T) and specification A-48-18 covering gray iron castings and that the members of the American Society for Testing Materials on the American Foundrymen's Association committee be designated to assist in the work of recasting these specifications at a meeting to be held at the Gibson Hotel, Cincinnati, between now and the time of the convention of the American Society for Testing Materials in Atlantic City in June. Specific data on the process of the adoption of the 1.2-in. x

18-in. test bar by the Institution of British Foundrymen are to be asked from Thomas Vickers, secretary, British Cast Iron Research Association. H. B. Swan, E. J. Lowry and Jesse Jones were delegated to meet with the members of the International Foundrymen's Congress in Paris next fall to discuss the adoption of the international test bar. It was arranged that a quorum of the committee members be present at the meeting of the American Society for Testing Materials committee at Atlantic City in June for the final discussion of the report.

It was generally regarded that the report of this committee marked a definite step in the direction of settling the question of the international test bar, which has been a matter of discussion at gatherings of the foundrymen for more than 10 years. Mr. Wood, who discussed the report and reviewed the history of the efforts toward standardization of pig iron specifications, told of his experiences in the importation of foreign iron and said that adoption of standard specifications among other things would make possible the purchase of foreign iron of guaranteed carbon content. He emphasized that the international test bar was entirely for foreign trade purposes and its adoption would in no way interfere with the bars now employed for domestic uses.

R. S. MacPherran, as the representative of the American Foundrymen's Association on committee D-5 on coke and coal, American Society for Testing Materials, reported that this committee will present to the Atlantic City Convention of the latter in June, a tentative method of determination of the per cent by volume of cell space of lump coke and also tentative specifications for gas and coking coals. As these specifications have not yet been reported to the convention and consequently have not been acted upon by that society, Mr. MacPherran stated that it would be hardly fair to present them in detail, especially as the proposed specifications, if adopted by the convention, would remain tentative for at least a year in order to afford opportunity for any possible adverse criticism.

#### Graphite in Gray Iron

"Graphite in Gray Iron" was the subject of a paper presented by J. W. Bolton, Niles Tool Works, Hamilton, Ohio. Quality of materials is important and graphite flakes influence quality, the author stated. The question of high or low carbon was purely a local one and depended upon individual conditions. Most foundrymen favored low total carbon. Adherence to standard testing methods was urged by the author, who declared that there was no magic short cut to better quality. Hard work on practical fundamental research was essential. Use of charcoal iron was not a cure-all in the correction of graphitic carbon.

Discussion brought out that there was altogether too much of a tendency on the part of those seeking an excuse for poor quality castings to put the blame upon sulphur. In the words of one speaker, sulphur was made the "goat." Mr. Traphagen, formerly with the Griffin Car Wheel Co., Chicago, detailed experiences with the sulphur element in cast iron car wheels, saying that it never ran below 0.14 to 0.16. He said that there was chance for error in calculating sulphur content through variation in the method of analysis, pointing out that in one test of iron, it ran 0.007 in sulphur by one method, 0.008 by another, 0.032 by another, 0.067 and even 0.093 per cent by other analytical processes. The sulphur in iron depends actually on blast furnace practice. Presence of sulphur up to 0.020 per cent was not a detriment to quality, was an opinion that found no dissenters.

#### Visual Observation of Cupola Melting

The final paper of the session, "Visual Observation of Melting in a Cupola," was presented by John Grennan, instructor in foundry practice, University of Michigan. The author discussed conditions in a cupola as observed through holes cut through the cupola shell. Six holes, six inches apart in a vertical row were made through the shell and lining and the condition of the coke and iron during the melting process was recorded. Upper tuyeres were held to be undesirable; the stock

should be of as even thickness as possible and of uniform analysis; that coke of uniform size should be used and that it is possible to improve the quality and

uniformity of the cupola melted cast iron by further study of the melting process were the conclusions of the author.

## Sessions Devoted to Non-Ferrous Subjects

BESIDES the two programs on steel foundry subjects, non-ferrous and sand problems were the only other matters to which two sessions were devoted. They were well attended, particularly the sand. Much interest has pervaded the non-ferrous meetings recently, whether held in connection with the foundrymen or the mining engineers.

### Papers on Aluminum Alloys

The opening non-ferrous meeting Monday afternoon, which was a joint session with the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, was devoted to various problems in connection with the use of aluminum and aluminum alloys. This session was presided over by Jesse L. Jones, Westinghouse Electric & Mfg. Co.

A feature of the meeting was the presence of Emile Ramas, president of the L'Association Technique de Fonderie de France, who was introduced, and spoke briefly, expressing his appreciation of the greetings extended to him.

#### Shrinkage of Aluminum Alloys

A paper on "Linear Contraction and Shrinkage of a Series of Light Aluminum Alloys" was presented by Robert J. Anderson, Bureau of Mines, Pittsburgh. This paper was issued as a contribution by the Bureau to the literature on the metallurgy of light aluminum alloys. Experiments were conducted to determine the linear contraction of a series of 40 light aluminum alloys on pouring into chill molds and sand molds with a view of obtaining data for use in making pattern allowances. The more theoretical aspects of the problems involved in the study of contraction were discussed in the paper and figures were given for the contraction of the 40 alloys when cast under different definite conditions. The writer referred to the fact that the rapid growth of the automotive industry has increased greatly the demand for light, strong, readily machineable castings, and aluminum alloys consequently have found extensive use for motor car construction.

While the bulk of production of light aluminum-alloy castings in the United States is made in the 92:8 aluminum copper alloy, several other alloys are employed commercially and the tendency now is toward an increased use of special alloys for particular purposes.

The results of the experiments show that the linear contraction of 40 aluminum alloys covering a wide range of chemical composition varies from about 0.95 to 1.80 per cent depending upon the chemical composition and other factors. The wide variation in contraction indicated that it is poor practice to employ any rough figure for the contraction of aluminum alloys in general, since by so doing much difficulty is found in producing master patterns and in obtaining castings with a minimum of wasters. Other conditions being the same, the smaller the cross-section of a bar the less is the contraction for a given length and the greater the length for a given cross-section the less is the contraction. The linear contraction is greater in chill molds than in sand molds. In sand molds the contraction depends upon the contour of the pattern, the mass of the casting and the method of molding.

At the conclusion of the paper, Chairman Jones remarked that the most difficulty that foundrymen have with aluminum castings is due to the shrinkage and that these difficulties are most pronounced where a heavy section joins a light section, and that is where a foundryman's ingenuity is required. There was no further discussion of the paper.

#### Magnesium's Density

A paper on the "Density of Magnesium from 20 to 700 degrees C." was presented by J. D. Edwards and

C. S. Taylor, assistant director of research and physical chemist, respectively, research bureau, Aluminum Co. of America. This paper, which was read by Mr. Edwards, stated that because magnesium is the lightest metal used for structural purposes, more than usual interest is attached to measurements of its density. Although the density of solid magnesium has been determined frequently, no measurements of the density of the liquid metal have been available. Unusual experimental difficulties in measuring the density of the liquid were encountered but a limited number of measurements of good precision were secured. The writers pointed out that the results, especially those showing the crystallization shrinkage are of great interest in connection with the casting of metal. The authors found that the crystallization shrinkage or the percentage change in specific volume in passing from a liquid of density 1.572 at the melting point to a solid of density 1.642 at melting point is approximately 4.2 per cent.

#### The Aluminum Alloy "Alpax"

A paper on the "Recent Progress in the Application of the Aluminum Alloy Alpax in the Foundry," prepared by R. de Fleury, France, was read by G. H. Clamer, the new president of the American Foundrymen's Association. This was the annual exchange paper submitted by the L'Association Technique de Fonderie de France.

The author reviewed briefly what alpax is and what its principal properties are. This is an alloy containing 13 per cent of silicon which has been invented by Mr. Pacz. The inventor is of American nationality and the first experiments were conducted in this country. The author discussed the properties and uses of this aluminum alloy. He stated that the alloy of aluminum and silicon, when treated with certain alkaline salts, has physical properties superior to the usual foundry aluminum alloys. The development of this alloy in France during the past 18 months was claimed to have demonstrated its practicability for many automobile parts. Because of its lightness, strength, and low coefficient of expansion and contraction it is being used for its cylinders, pistons, connecting rods and other automobile castings. The author stated that alpax has a density of 2.6 to 10 per cent lower than that of the usual aluminum alloys used for castings. Its density is one-third that of steel and its resistance to atmospheric agents is at least equal to that of pure aluminum or far superior to the usual aluminum alloys. It was further claimed to be a perfectly water-tight metal, making it well adapted for use for gasoline engine cylinders, and that its contraction does not exceed that of cast iron and is much less than that of ordinary aluminum alloys. In addition it was stated that the metal has valuable bearing qualities.

D. Basch, General Electric Co., in a discussion of this paper said that he had experimented with high silicon aluminum alloys and that their greatest advantages were resistance to salt water corrosion, elongation, high tensile strength, good foundry properties and not too great stiffness. He had used a 5 per cent silicon alloy and had obtained results which he had not been able to duplicate in any other alloy. He stated that two companies in this country are now using high silicon aluminum alloys, one for sand castings and the other for die castings. J. D. Edwards remarked that silicon expands on freezing, while the aluminum is contracting, and that the expansion of the silicon reduces the shrinkage so that the contraction is relatively light. Some difference of opinion was expressed as to the bearing qualities of high silicon aluminum. Mr. Clamer regarded as quite startling the claim of good bearing qualities for alpax.

"Casting Aluminum Radiator Shells" was the subject of a paper by W. A. Mills, Jr., Alloy Foundry & Machine Corporation, New Rochelle, N. Y. The author



discussed shop methods that have been used to successfully cast aluminum radiator shells where high quality and finish are required. He stated that pinholes and lack of lustre after polishing have been the principal objections to aluminum radiator shells in the past but that these difficulties have been overcome. For large production work two roll-over jolt pattern draw machines are required, one for the nowel and the other for the cope. Experience has proved that an alloy of 94 to 95 per cent aluminum and 5 to 6 per cent copper gives the best results for a high polish and a dense casting. The use of scrap aluminum is not recommended as it causes various troubles. A low pouring temperature of from 1250 to 1300 deg. Fahr. is recommended. The design of some shells is such that they are very difficult to cast and their production is out of the question.

### A Session on Brass and Bronze

The second session devoted to non-ferrous subjects was held Tuesday morning, May 1, with G. H. Clamer as chairman. This was also a joint session with the American Institute of Mining and Metallurgical Engineers. Four of the papers on the program were A. F. A. papers, with the last one credited to the mining engineers, entitled "Effect of Heat Treatment on Release of Stress in Bronze Castings" by R. J. Anderson, Bureau of Mines, Pittsburgh, and C. H. Eldridge, Metropolitan Museum of Art, New York.

#### Pouring and Melting

The first paper which was presented entitled "Notes on the Proper Pouring and Melting of Brass and Bronze" by F. L. Wolf and W. Romanoff, Ohio Brass Co., Mansfield, Ohio, in the absence of the authors was abstracted by Dr. Paul D. Merica, International Nickel Co., New York. The authors discussed various shop problems encountered in making castings, such as pouring temperatures, comparison of melting furnaces, properties of castings from mixtures of ingots, scrap and composition ingot metal, fluxes and de-oxidizers. Various conclusions are reached. Considerable discussion was participated in by N. K. W. Patch, L. W. Olsen, G. F. Comstock, Dr. P. D. Merica and others. Mr.

Comstock pointed out that the test bar figures in the paper would be of value only if the results were average of tests on many bars. There was considerable discussion on the use of furnaces, and the paper which was regarded as a good practical one aroused much interest.

The second paper entitled "Casting Bronze Tablets" by Jacob G. Kasjens, Brass Foundry Co., Peoria, Ill., who recently died, was abstracted by E. E. Thum, associate editor, *Chemical and Metallurgical Engineering*, New York. A brief discussion followed its presentation relative to methods of molding such tablets.

#### Contraction of Brass and Bronze

"Linear Contraction of a Series of Brass and Bronzes" by Robert J. Anderson, Bureau of Mines, Pittsburgh, and E. G. Fahlman, National Smelting Co., Cleveland, was presented in abstract by Mr. Anderson. The paper is based on an investigation carried out by the Bureau of Mines for determining the linear contraction of such alloys on casting into sand molds so as to obtain data for making pattern allowances. Linear contractions noted varied roughly from 1.1 to 2.2 per cent, depending on chemical composition and other factors. High temperature pouring was found to yield less contraction than low temperature.

In discussing this paper, N. K. W. Patch stated that the results obtained by the authors agreed well with those of the Lumen Bearing Co., Buffalo. It is emphasized by Mr. Anderson that pattern allowances to be made must vary with the pouring temperature and the size of the section.

#### Brass Turning Briquettes

A paper on "Briquetting Brass Turnings" by F. L. Wolf, Ohio Brass Co., Mansfield, Ohio, was presented in abstract by W. Romanoff.

The fifth paper of this session, referred to above, by Messrs. Anderson and Eldridge was presented by Mr. Anderson. It was not preprinted. It was discussed by Mr. Patch, who mentioned the use of annealing to relieve casting strains in flat plates by the Lumen Bearing Co., and who also discussed the heat treatment of aluminum bronze at the same plant.

## Some Features of the Exhibition

THE foundry exhibition, aside from bringing together a large display of representative equipment including considerable new equipment used in foundry operation, had another outstanding feature that developed during the five days of the exhibit. That was the large number of actual orders placed on the exposition floor and the large volume of live prospects for business that was developed by exhibitors. It seemed to be the almost unanimous declaration that both the real and prospective business that developed far exceeded in volume that which came out at any previous foundry show and was much larger than expected at the opening of the exposition.

The molding machine exhibition of new equipment showed a tendency toward faster and more easily operated machines, with more automatic features, more complete inclosure of working parts, sturdier construction and various refinements in design as well as fool-proof features.

A general account of the exhibition was published in THE IRON AGE, May 3, including details as to the opening and the building in which it was housed.

#### Molding Machines

The Rathbone multiple molding machine was exhibited by the Grimes Molding Machine Co., Detroit. This machine was first exhibited 17 years ago but it was stated that recently it has attracted much more interest than heretofore. The machine shown differs from the original design in that it has a swinging head instead of trunions. The machine is designed for making a drag impression on the upper side of every cope.

These molds are piled together making what is known as a multiple stack.

Three new types of molding machines were shown by the Osborn Mfg. Co., Cleveland. One was a 500-lb. capacity roll-over jolt machine with a center of gravity roll-over table. The principal difference in this machine as compared with one of this type heretofore made by this company is that the roll-over table does not set on the jolt which is 6 in. below the table. This allows a small offset on the roll-over table and a low ramming position without setting the machine in a pit, and makes it possible to roll-over without raising the load. It was pointed out that this design saves two operators.

Another new Osborn machine is of the roll-over jolt squeezer type, which is similar to a former machine, except that it has the addition of a squeeze. After the mold is jolted it is struck off flush, the bottom board is placed and clamps are thrown in position. The mold is then rolled over, a squeeze cylinder comes up against the bottom board squeezing the mold, the clamps are released and the vibrator starts. The downward stroke of the squeeze cylinder draws the pattern from the mold. This is claimed to be a fast machine, with a capacity for making a one-half mold per minute.

The third new Osborn unit was a small stripping plate jolt squeeze machine of 400 lb. capacity. This is designed to take a flask length within the range of the machine and in width up to 12 to 15 in. The machine jolts the mold in the usual way, the squeeze head is brought into position and the squeeze cylinder is raised bringing the squeezing board in contact with the mold, squeezing the top surface. The downward stroke of the squeeze cylinder also draws the pattern. The three types are equipped with automatic vibrators. The Osborn company also showed its large sized roll-over jolt

machine of 1800 lb. and larger capacity with various improvements. This has a new device that completely rolls the roll-over table into a locking position without touching by hand. A new air control on the draw cylinder permits the roll-over table to be rolled over and back again at a uniform rate of speed. It was stated that the average time for rolling over is 9 sec. and for rolling back 8 sec. By a unique mechanism automatically operated from the leveling pin on the leveling car, automatic adjustment for any depth within the range of the machine is instantly obtained. The depressing of the leveling pin  $\frac{1}{2}$ -in. by contact with the bottom board sets the mechanism which stops the machine for the given flask space. A brush attached to the front of the leveling car sweeps the loose sand from the jolt table which was formerly done by hand.

Henry E. Pridmore, Inc., Chicago, exhibited an air jolt air power roll-over machine. Heretofore this company has made the machine only electric jolt and hand rammed types.

Various improvements and refinements were shown in the jolt roll-over squeeze and draw hand-operated machine for making the cope and drag at the same time that was exhibited by the American Foundry Equipment Co., New York.

Wm. Demmler & Bros., Kewanee, Ill., exhibited a new revolving type core machine designed for large production.

Wm. H. Nichols Co., Inc., Brooklyn, N. Y., exhibited a jolt squeeze and stripping machine for making car-wheel molds. This machine was similar to one that has been made by this company for making molds for mine cars and automobile wheels but is of a heavier type and more rigid in construction. It has a 24-in. squeeze piston and the distance between uprights is 54 in.

An automatic machine operator designed for controlling the pattern draw and jarring operations of a molding machine was shown by the Tabor Mfg. Co. This is arranged so that it can be timed to suit various molds by the changing of the timing gears and the number of blows is controlled by a cam roller. The machine exhibited was connected to two machines, one a plain plate pattern machine and the other a stripping plate machine. It is pointed out that with the use of this machine operators are compelled to work at a certain speed and that the molds will be uniform.

The Stoney Foundry Engineering & Equipment Co., Cleveland, exhibited its new type of shake-out bale in a size designed to handle a 12-ton flask 6 ft. wide and up to 20 ft. trunnion centers. This bale has vibrators with  $5\frac{1}{2}$  in. bores with a speed of 900 strokes per min. Instead of bale form used on the smaller unit the two vibrators are suspended from chain.

The Keller Mechanical Engraving Corporation, Brooklyn, N. Y., showed a die sinking machine for core box and pattern work. This is a new application of a machine for die work that was exhibited at the steel treaters' convention in Detroit last October. It has a capacity for making patterns up to 40 in. in length.

#### Sand Blast Equipment

A comprehensive exhibit of sand blast machines was included among the numerous devices and equipment shown. Many of these machines were in operation. The Hoevel Mfg. Corporation, New York and Jersey City, owned and controlled by L. O. Koven & Brother, exhibited a new model of sand blast barrel, which is 4 ft. shorter than previous types to allow for headroom and is especially adapted for older foundries where the ceilings are low. The over all height is  $8\frac{1}{2}$  ft. The bearings of the barrel have been increased  $\frac{3}{4}$  in. in width and the steel of the barrel is thicker. The drive chain and sprocket are of much heavier construction. This machine is built in two types, one with a barrel 32 x 40 in. long with two nozzles and the other with a barrel 32 x 24 in. long with one nozzle.

Working exhibits of all of its various types of sand blast equipment were displayed by the Pangborn Corporation, Hagerstown, Md. Included were its down-draft sand blast room, its hygienic table cabinet sand blast, its standard pressure gravity rotary table sand blast, its direct gravity standard pressure barrel sand blast, its type GF barrel sand blast and its cloth screen dust arrester.

The J. W. Paxson Co., Philadelphia, showed its sand blast barrel machine with improved sand filling valve, sand feeding valve and unloading device, and its sand blast table machine with improved sand filling and feeding valves and improved driving mechanism.

The W. W. Sly Mfg. Co., Cleveland, featured its tilted sand blast mills in the larger and smaller types, together with its pneumatic lift elevator which was exhibited for the first time. The pneumatic elevator lifts the heavier abrasives such as shot, grit and the coarser sands, together with the dust, to a separator where the heavier materials are returned by gravity to the foundry floor or to a pressure tank or whatever equipment is being used, whereas the abrasives which are of no further use go to the dust arrester. The elevating machinery contains no moving parts.

The MacLeod Co., Cincinnati, exhibited one of its suction type of sand blast tumbling barrels, a feature of which is that the barrel has no outside casing and has few wearing points. It is equipped with sand collectors which reclaim the steel shot or heavier sand used as abrasives. From the collectors the abrasives are pneumatically lifted back to the barrel for reuse.

#### Welding Equipment

One of the new developments in welding practice shown was a welding electrode developed by the General Electric Co., which is said to have the following merits: Arc stability, rapid deposition, diversity of application, strength and ductility of deposited material. The electrode is a composite one consisting of a central metallic core surrounded by a layer of flux which is inclosed by an outer metallic layer or sheath. This prevents the flaking off of the flux in handling and insures that it will not be dissipated by the arc before the actual melting down to the metallic element of the electrode. It also gives a clean metallic surface for handling and for feeding current from the holder into the electrode. No binder is necessary in the flux and the quantity required for the best results is found to be quite small, leaving nearly all of the total weight of the electrode in the metallic elements. The General Electric Co. also exhibited its repulsion induction type of melting furnace which is suited not only for melting copper and all brasses and bronzes, but also will produce, it is said, 99.3 per cent pure iron.

The "Weldrite" electric welding machine was exhibited by the Electric Welding Machine Co., Detroit, Mich. It is designed for welding without pre-heating and it is claimed it will weld malleable iron and steel as well as gray iron. It is asserted that welds can be made in finished castings, such as automobile cylinders, without hardening the metal at the weld.

The Super Arc Welding Machine Co., Detroit, Mich., demonstrated the use of a Super Arc welder on cast and malleable iron. The machine, it is said, delivers sufficient heat at the point of the electrode to force a penetration of  $1/16$  to  $5/16$  in. and produces a weld which can be machined.

The Allan Mfg. & Welding Co., Buffalo, not only exhibited its semi-arc welding machine, but also a portable adjustable electric grinder for removal of excessive metal or high spots from cylindrical surfaces. The machine is especially adapted for removing excess welded metal. It is also suited for the salvaging of machined and partially finished cylinders and cylindrical surfaces having slight defects.

#### Cupola Flux

The Hillside Fluor Spar Mines, Chicago, showed samples of fluor spar and fluorcite. Fluor spar is recommended for use with limestone as a cupola flux, whereas fluorcite containing  $1/3$  fluorspar and  $2/3$  lime, a new product just introduced by the company, is offered to the trade as a "complete cupola flux." It is pointed out that all steel companies having basic open-hearth furnaces use fluor spar and limestone as a flux to make sound and clean steel, to hasten the period of heating, and to eliminate impurities. These materials as combined in fluorcite will, it is said, insure the same results in cupola practice.

The American Foundry Equipment Co., New York, exhibited the American "Type K" foundry and sand



cutting machine, which is constructed with a rugged frame of cast and structural steel and three-point support. Dust proof ball and roller bearings are used throughout and gears and shafts are of hardened steel. Operating power is supplied by a 15 or 20 hp. electric motor, and three speeds, forward and reverse, are provided. The machine is steered by independent application of power to either tractor wheel. The cutting cylinder hoists and lowers by power. The same machine is exhibited with a gas engine drive.

The Simpson intensive foundry mixer, for the preparation of facing and core sands, and for mulling and rebonding heap sands was shown by the National Engineering Co., Chicago. The Simpson bucket loader was also shown.

A sand cutting machine in which all the sand cutting elements are centered and rotated about the center axes of machine, which places the load on the tractor wheels was called attention to by H. L. Wadsworth Co., Cleveland. The machine operates in a very small space, and is designed especially for use on soft floors.

#### Material Handling Equipment

The Loudon Mfg. Co., Fairfield, Iowa, exhibited a roller bearing push and pull crane in 1000 and 2000 lb. capacities, for use in overhead track systems and operated by one man under light or heavy loads. Safety features are incorporated in the crane. The end-truck is designed to project down to within a half inch of the runway track. Should the crane be subjected to sudden shock the end-truck could not be thrown off the runway, it is claimed, because the steel bridge members project over to the center of the rails and the crane could not drop more than one half inch until it would rest directly on the rails.

The Elwell-Parker Electric Co., Cleveland, exhibited the Master electrical industrial crane truck, which is a combination lifting, stacking and hauling

unit. The truck loads its own platforms, piles them up to 12 ft. high, and with boom extended horizontally has a lifting capacity of 1000 lb. at a 24 ft. radius. The National Scale Co., Chicopee Falls, Mass., exhibited its E-Z angular lift elevating truck, the principal feature of which is that a load of material can be elevated at any angle.

#### Core Ovens

A continuous conveyor floor oven, with cooling chambers so arranged as to reclaim practically all of the heat given off from the cores after baking, was displayed for the first time by Young Bros. Co., Detroit. It also exhibited a trackless trolley, drawer type floor oven, of the same type of installation made at the foundry of the Pullman Co., Pullman, Ill.

The F. A. Coleman Co., Cleveland, exhibited a new type insulated oven, incorporating several safety devices which can be heated with any kind of fuel; also a new rolling drawer oven, which although set up as an electric unit, can be equipped for any other fuel.

The Cannon radiating core oven was shown by the Carborundum Co., Niagara Falls. This oven, designed and patented by Cannon Bros., has been taken over by the Carborundum Co., and has many other uses beside the baking of cores. Heating element is introduced through a flue at the bottom of the oven and arranged in a way to give even heating through radiation. Burning either fuel oil or gas, high combustion efficiency is claimed for the method, while the use of carborundum brick, it is claimed, means faster radiation than through clay fire brick.

The Foundry Equipment Co., Cleveland, showed its latest type of rolling drawer core oven, designed for coke, oil or gas as a fuel. This company distributed literature describing its new cast iron pot furnace, tilting type, for melting aluminum or white metal alloys that can be poured at temperatures below 1500 deg. Fahr.

## The Business Session, the Banquet and Social Features

THE annual business session, scheduled for 4 p. m., Tuesday, May 1, was an hour late in starting because of the unusual length of the session on sand research held in the same room. It was presided over by the outgoing president, C. R. Messinger, Chain-Belt Co., Milwaukee.

#### New Honorary Members

After the election of officers had been announced, as reported in THE IRON AGE, May 3, Secretary Hoyt stated that at a meeting of the board of directors held April 29, the following persons had been elected to honorary membership of the association: C. R. Messinger, Dr. George K. Burgess, the new director of the Bureau of Standards, and Prof. H. Ries, Cornell University, Ithaca, N. Y.

#### Two Recommendations by the President

Because of the lateness of the hour, the president did not deliver the customary address nor did the secretary read his usual annual report. President Messinger, however, called attention to two recommendations in his address. One was to the effect that the position of technical secretary be created by the board of directors. Such an officer, in his opinion, would be able not only to relieve Secretary Hoyt, and also the president, of many of the details of the technical program, but could be of inestimable value to the organization as a whole in promoting technical activities and attending to other matters of a similar nature. The other recommendation was that the American Foundrymen's Association organize local chapters or sections similar to some of the other technical societies. If this plan were decided upon, the new technical secretary would be the active agent in the organization of such local sections. It was the opinion of the president that the carrying out of these two recommendations, among others, would decidedly increase the prestige of the American Foundrymen's Association and promote its value not only along the

lines of its present activity but also from a technical point of view.

#### Secretary Hoyt's Report

Secretary Hoyt in his brief report, which will appear in full in the *Transactions*, showed that the total book membership as of Dec. 31, the end of the fiscal year, was 1570, and that the net gain from Jan. 1 to May 1 of 146 had brought the total active membership to 1602, less those that were delinquent or had resigned. The report points to the interesting fact that the membership in the last four months has climbed upward and that in the last four months, or from Jan. 1 to May 1, there had been a larger net increase than in all of 1922.

The usual resolutions of appreciation of the hospitality of Cleveland and the various committees which in hand the handling of the local arrangements, and appreciation of the attention which the press of Cleveland gave to the activities of the week, and a recognition of the heavy burden borne by the officers and committees of the association were adopted as prepared by the resolutions committee, consisting of Alfred E. Howell, chairman; Edwin F. Cone and A. E. Hageboeck.

A feature of the entertainment program, which was elaborate, was the leasing of the entire Keith's Palace Theater, which was filled Tuesday evening, May 1, with over 3000 foundrymen and their friends.

#### The Banquet

The annual banquet was held at Hotel Cleveland, Wednesday evening, with a capacity attendance. A feature of the program was an address by Emile Rams, president Association Technique de Fonderie de France, who brought the greetings of the French foundrymen's association to the American organization. The retiring president, C. R. Messinger, called attention to the contrast between business conditions a year ago and today. The remarkable recovery of economic activity in that

brief time was illustrative, he said, of the sharp business reactions through which this country had passed. He called attention to the fact, however, that the American Foundrymen's Association has weathered all storms. On behalf of the association he extended thanks to the people of Cleveland who had provided all entertainment features of the convention except the banquet.

#### The International Convention in Paris

G. H. Clamer, the president-elect, also delivered an address, outlining the plans for the trip abroad which will be taken by members of the association in response to invitations from foundry and other technical organizations in France, Belgium and Great Britain. The party will sail on the Leviathan on Aug. 5, and will spend about 15 days in England and several weeks on the Continent. The time will be devoted to plant visitation, sight seeing and social functions. Thus far, approximately 50 members of the associa-

*G. H. Clamer, the new president of the American Foundrymen's Association, was vice-president last year and has long been identified with the non-ferrous foundry industry through his company, the Ajax Metal Co., Philadelphia*



tion have signified their intention of taking the trip. The party will sail for home on Oct. 3.

Announcement was made of the receipt of a donation of \$1000 from V. E. Minich, president American Foundry Equipment Co., New York, to be used by the association for molding machine research.

#### General Allen Tells of Europe and the Ruhr

The leading address of the evening was by Major General Henry T. Allen, who was in charge of the American forces on the Rhine, and even after the lowering of the American flag at Coblenz, remained for some time as an official observer. This was his first public address since returning from Germany. General Allen stated that the French military authorities soon after the armistice had planned for the separation of the west bank of the Rhine from the rest of Germany. He read a letter written by General Pershing to President Wilson, dated May, 1919, which called attention to the fact that one of the French generals had inquired as to the American attitude toward a revolution on the west bank of the Rhine and asserted that there were 50 French deputies ready to be sent into that sector to encourage the insurrection. He said that at first the German industrialists had favored setting up such a separate state because they were not inclined to help pay the German debts and thought that the inhabitants would not object, owing to their dislike for the Prussians. At present, however, those favoring separation have a very small following, as the Germans in general now feel that the French have violated the spirit of the treaty by many big things and innumerable small things.

No one can say how long the occupation of the Ruhr will continue, he said, regardless of reports from the press that some sort of a settlement is impending. The economic loss to all concerned has been tremendous. The occupational cost to France and Belgium in the first four months involved a direct outlay of 441,000,000 francs, the loss of business to the allies during the

period probably totaled fully 500,000,000 francs, and the loss to the world ten times that much. At the same time 1,000,000 workmen have been made idle as a result of the occupation. If Europe were now at peace, America would be enjoying prosperity such as she never saw before.

General Allen does not believe in the traditional American policy of isolation. The United States, he said, has long since ceased to be a colonial people and her world wide necessities for raw materials and manufactures alike make the interests of the world her own interests.

#### American Malleable Castings Association

A joint meeting of the eastern and western sections of the American Malleable Castings Association was held at the Hotel Cleveland Wednesday forenoon, with a large attendance of members. Two brief talks were delivered. C. A. Callendar, Erie Malleable Iron Co., Erie, Pa., discussed pattern shop methods and Prof. Enrique Touceda discussed the value of scrap in the mixture. A report of the refractories committee was submitted by its chairman George L. Moorehead, of the Link Belt Co. This committee is cooperating with a similar committee of the Refractories Manufacturers Association with a view of adopting the most suitable brick for malleable iron practice and standardizing on the size of the brick. The conclusions will be submitted to the membership of both associations for adoption. G. R. Metcalf, Jr., Erie Malleable Iron Co., submitted the report of the committee on annealing. This committee is attempting to determine the cause of scale in the anneal and expects to have a comprehensive report shortly.

In compliance with requests from the Department of Commerce the association has decided to furnish the Government with monthly reports regarding the malleable iron industry. These reports will include capacities of foundries, production and bookings, and possibly shipments. These reports will cover foundries both in and outside the association. During the afternoon the members attended the malleable session of the American Foundrymen's Association.

#### Sand Problems and Foundry Training

An important and comprehensive symposium on "Industrial Education—or Training of Foundry Workers" was held on Tuesday morning, May 1, and presided over by Dr. Richard Moldenke. Contributions by 11 leaders in such work were presented and discussed.

The sessions devoted to sand were also featured by interesting papers and discussions.

A review of these sessions will appear in THE IRON AGE May 17.

#### Future Course of the Institute of Metals

An important discussion unexpectedly arose in the open meeting of the directors of the Institute of Metals division. It had to do with the future activity of this organization—whether it should continue its connection as part of the American Institute of Mining and Metallurgical Engineers or associate itself with some other society. No decision was of course reached.

The Sullivan Machinery Co., Chicago, has issued a booklet No. 72-G entitled: "A Handbook of Rock Drill Steel." It is in reality an instruction book for the care and use of drill sharpeners made by that company and of drill steel furnaces. An endeavor has been made to include subject matter which would not be in an ordinary machine instruction book, covering special uses of the sharpener, some theoretical matter on the treatment of drill steel, a practical man's description of the layout of drill sharpening shop and its equipment, a short discussion on proper heating of drill steel, and specifications for steel to enable the purchaser to select proper steel for drilling work.

A third annual machine tool exhibit will be held at New Haven by the Connecticut branch of the American Society of Mechanical Engineers. As was the case last year, the exhibition will be held in September.



# Use of High Silicon Irons in the Foundry

## How the Present Situation in Respect to Supply and Demand Has Grown Up—The Blast Furnaceman's View- point and the Scrap Factor

BY E. J. LOWRY\*

**H**ARDNESS of a gray iron casting is mainly determined by the percentage of total carbon, combined carbon and silicon present in the casting. Inasmuch as silicon acts on the total carbon to free the combined carbon, foundrymen consider this element to be the most important.

The foundryman succeeds in producing machineable castings by the introduction of silicon through various means in the metal charge in his cupola. He has recourse to pig irons of proper silicon content, or by mixtures of high silicon irons with low silicon irons obtains the proper silicon content. He may operate his cupola on a low silicon content with a high total carbon or a high silicon content with a low total carbon and produce similar results. It becomes difficult, therefore, to discuss "silicon irons for foundry use" because of the varied ideas and mixtures existing throughout the country. But it is known that all foundrymen are coming to the conclusion that the mixture of irons should be as simple as possible in order to obtain proper results in the foundry. This simplification of mixtures naturally eliminates silvery irons and to some extent the lower silicon irons. The irons the foundryman has left for his selection are then designated by Foundry No. 1 (Western designation) or Foundry 2X (Eastern designation) and the 2.75 to 3.25 silicon grade.

### Diversity in Grading

The grading of pig iron is not uniform through the country. No. 1 foundry in the West compares with 2X foundry in the East. Below is a table comparing the grades in the East and the West:

East	Silicon	West
Foundry No. 2	1.75 to 2.25	No. 2
Foundry No. 2X	2.25 to 2.75	No. 1
Foundry No. 1	2.75 to 3.25	No classification
Foundry No. 1 soft	Above 3.25	No classification

Some time in the future these grades may disappear and a real analysis basis be assumed for pig irons. This will simplify the conditions existing in the use of pig iron throughout the country.

When a foundryman desires pig iron he naturally orders the grade that will fit his requirements. The average foundry manufacturing automobile, machine and similar grades of castings is working for a final silicon analysis between 1.75 and 2.25. If there were no loss of silicon in the melting operation he could nicely use the No. 2 grade; but as the cupola "burns out" some silicon he must have a No. 2X (in the East) or a No. 1 (in the West). This latter grade allows him to use up his return scrap and perhaps use some outside scrap. If the foundryman is running a more economical mixture, one with a high percentage of scrap, he will require a No. 1 (in the East) or a 2.75 to 3.25 (in the West) grade of pig iron.

### Change in the Habit of Buyers

The old method used in obtaining the final analysis was to place a No. 2 foundry iron in the mixture and then build up the silicon content by the use of silvery irons. This gave the final analysis that was sought. As time progressed and production was increased, melting conditions in the cupola changed, so that instead of obtaining a uniform analysis by the above mixture, the foundryman received soft castings in one part of his heat and hard castings in the other. This was caused by the irons not being properly mixed. The foundryman then became convinced that a pig iron carrying the proper silicon content to give him his final result was the iron for his use. Obviously

this increased the consumption of higher silicon irons throughout the country. Consequently, where furnaces used to manufacture high silicon irons as an incident to "blanking" their furnaces, together with short runs, this production could not satisfy the new demands.

There has been no effort to increase the production of higher silicon irons, and this especially in the Northern furnaces. In fact, there has been a marked decrease in the manufacture of No. 1 silicon irons in Northern furnaces.

### The Blast Furnaceman's Viewpoint

It would be economically unsound for a furnace to operate on higher silicon irons when it can readily dispose of the No. 2 grades. This is substantiated by the fact that No. 2 foundry irons are produced with approximately 2300 lb. of coke, whereas the next higher grade of iron requires approximately 2600 lb. of coke. This increase of coke at the present market (\$6.50 per net ton) increases the cost of manufacture at the furnace approximately \$1.65 per ton, when considering the coke charge alone. Unfortunately, most of the merchant furnaces are working on coke contracts (coke at the ovens approximately \$8 per net ton), which increase the cost of manufacture \$1.88 per ton.

The old differential between the two grades of iron being but 50c. per ton does not appear attractive to the pig iron producer and the new differential of even \$1 per ton does not make a satisfying increase in the price to warrant a furnace concentrating its efforts on the higher grades of silicon irons. Then, too, with the increased consumption of pig iron, together with some "oversold" furnaces, every furnace is desirous of obtaining its maximum production. A furnace working on No. 2 foundry gives the maximum output, while a furnace working on No. 2X Foundry (in the East), or No. 1 Foundry (in the West) has its production reduced approximately 25 per cent. It is hard to figure the increase in cost of this lessened production, but it is obvious that a furnace cannot work economically upon these higher grades of iron.

### The Case of Southern Iron

In the South a different condition exists. The "lean" ores used require added coke to reduce them properly, and this added coke causes the hearth temperatures in the blast furnace to be such that higher silicon irons are readily made. In addition to this factor the South has better conditions because of the short freight hauls and because of the labor conditions in that part of the country. But there is always some factor which hinders the use of the Southern foundry irons in general. The present day hindrance is the low manganese content in these irons. It is well known that when high silicon irons are produced it is harder to get a high manganese content.

Because of this lower manganese content foundrymen are unable to use higher percentages of Southern iron. There is the conception in foundry work that high manganese is necessary to the proper production of a casting. Foundrymen have forgotten that manganese has its first relation to sulphur. After the manganese has performed its work with this element it strikes at the total carbon present, giving a form of combined carbon which hardens the casting. It must not be understood that high manganese is a detrimental factor in a casting; but perhaps too much stress is being laid upon the total manganese present. If it were not for this impression, Southern irons of higher

\*Metallurgist, Hickman, Williams & Co.

silicon contents would be more extensively used in the country. Then with this iron the foundryman could mix his higher manganese, lower silicon Northern iron and obtain an analysis fitting for the grade of casting he wishes to produce.

#### Averaging the Silicon Limits

The problem of foundrymen would perhaps be somewhat minimized if on a "grade" contract furnaces were required to furnish as an average the middle analysis of the grade ordered. For instance, a No. 1 foundry iron is contracted for and the foundryman has the impression that he will receive a 2.50 silicon average on his shipments. The furnace, however, has the privilege of shipping irons anywhere between the limits of the grade ordered. Instead of the buyer receiving an average analysis, it is more often the case that the average is considerably below that. Of course it is obvious that a furnace cannot meet such a condition as that of shipping 2.50 per cent silicon in every car of iron, nor could it be expected that a furnace could be compelled to control such an average, but at least it might be expected that when a 2.25 to 2.75 per cent silicon grade is ordered the foundryman has a right to expect a percentage considerably above the lower limit of this grade. This is not a reflection upon the furnaces of this country, but indicates some negligence on the part of foundrymen who have so long been satisfied to accept irons "as is." It must be remembered that to insist upon an average for any one grade limits, to some extent, the operation of the furnace. Therefore, foundrymen should specify so much tonnage on either side of the middle content of their grade and be prepared to pay a premium for the selection of casts.

#### The Scrap Factor Important

The question of silicon in the foundry cannot be considered without some reference to scrap. This material is becoming an essential factor in the foundry. With the new conceptions of the metallurgy of cast iron, scrap becomes an asset to the cupola process. Various grades of cast scrap are offered for foundry

consumption. To make use of it lessens the cost of production and produces a somewhat stronger casting. The trouble with this use of scrap is that the scrap dealers sell scrap "as is" and "where is," without a knowledge of the analysis of the product. The wide variation in the analyses of the castings in the scrap causes the foundryman to be skeptical of its use. In the same lot of scrap there may be low silicon and high silicon pieces. The same castings may be made of gray iron mixtures or of semi-steel mixtures. The foundryman figures that the latter causes trouble in his melting.

Experience proves otherwise and that semi-steel scrap aids the production of strong castings. Then, at one time or another, the foundryman may be consuming the low silicon portion, and then again he may be using the high silicon pieces. It is evident that such an operation would give an un-uniform product in the resulting castings. But a foundryman may assure himself of a reasonable variation by concentrating his purchases on those grades of scrap in which he is assured of a fairly uniform analysis. A premium is always exacted for the careful preparation of grades carrying such uniformity.

The subject of silicon in the foundry is a relative one, inasmuch as silicon is but one of the factors which influence the production of the soft castings in the foundry. Consequently, only the major points have been touched upon here. But it is keenly felt that the foundrymen of the future will begin to demand higher silicon irons for their purposes, and that the furnaces will find that it is to their advantage to produce them in order to satisfy their clientele. At the present time but a limited number of furnaces in the North are able to contract for the higher silicon irons. It is certain that if the furnaces are unable to satisfy the demands of the consumer, no one pig iron merchant is in a position to furnish high silicon grades of iron, because all are dependent upon the production of the blast furnaces.

It is hoped that further comment will be made on this subject, in view of the limited knowledge at present available for the use of the foundry trade.

## BLACK SHEETS EASIER

### Conditions Less Tense in Youngstown District—Strip Prices Shaded

YOUNGSTOWN, May 8.—Somewhat quieter conditions prevail in the iron and steel markets, particularly reflected in black sheets. Makers unable to give deliveries some time ago under 60 to 90 days, are now able to make shipments in from three to four weeks. This let-down is attributed to less urgency in demand and maintenance of a high production rate for the past two months, together with satisfactory transportation conditions.

There is well sustained demand for blue annealed sheets. Galvanized production has been limited for several months and there is still a large unsatisfied demand. No such early deliveries as in the case of black sheets are possible.

Full finished sheet requirements continue heavy, however, and buyers are seeking positions on third quarter books. The chief independent producers in this district are sold ahead through the quarter, the automobile industry absorbing the bulk of the mills' output. Capacity of three additional mills now under construction will be available for next quarter delivery by an independent interest.

In the pipe market, independents are sold ahead for 90 days and could extend their obligations to six months were they so inclined. In some of the standard sizes, there exists an actual shortage of pipe, declares an important producer, with no likelihood of decline in demand at an early date. The larger sizes of tubes going into the oil fields are still required in substantial tonnages.

Fabricators catering to the building trades are feeling the effects of higher third quarter prices. Such in-

terests in the Youngstown district are sold well into the fall.

Independent tin plate interests are reported to be meeting the American Sheet & Tin Plate Co. price of \$5.50 per base box, announced for the third quarter, where their customers would be placed at a disadvantage with consumers securing supplies from the leading interest. However, a price of \$6 per base box more nearly represents their idea of the market, and any business calling for early delivery carries such a price stipulation.

There is some easing in the strip market, especially in hot rolled flats, due to the fact that certain interests have open schedules and are inclined to shade prices to fill them. Such mills are willing to enter tonnages at 3.30c. and less for the ordinary sizes, whereas others, with well filled order books, are asking a minimum of 3.50c. and up to 3.75c. for the narrow stock.

### Annual Wage Conference

The annual wage conference between the Western Sheet and Tin Plate Manufacturers' Association and the Amalgamated Association of Iron, Steel and Tin Workers opens next week, May 15, at Atlantic City. Employees in mills operating under the sliding scale wage agreement of the Amalgamated Association ask wage increases on the base rates of from 10 to 20 per cent.

It is unlikely that the Youngstown Sheet & Tube Co. will have a representative at this conference for its Brier Hill division, as the former interest has always operated on an open shop basis. Heretofore, however, the Brier Hill Steel Co. has always been represented at these negotiations.

Immediately following the conference in the sheet and tin plate divisions, the annual bar iron wage conference will take place.



# Excessive Caution Declared Not Desirable

## Government Officials Surprised by Tendency Toward Timidity—Secretary Hoover Plans Further Cooperation with Business

BY L. W. MOFFETT

WASHINGTON, May 7.—The rising note of caution against a period of inflation has reached such widespread proportions throughout the country that Government officials have expressed surprise over it. Curiously enough, the admonition not only originated in the business world itself, but has been given its chief stimulus from that source. While it is true that Government officials are on record as being in sympathy with a moderate course in business conduct, the degree of prudence urged by prominent industrial leaders, among them iron and steel men, as well as financiers, actually exceeds that advocated by Government officials themselves. From the outset it has been the policy of the present Administration to have "less government in business and more business in government." Manifestly the idea, whatever the success of its application, has been to reduce the amount of mere meddling in business and to substitute cooperation.

To this end, an outstanding feature has been the many conferences between business interests of the country and Secretary of Commerce Hoover and his bureau and divisional chiefs; the development of large statistical studies through cooperation between the department and the various industries of the country; the working out of a program of simplification, and standardization, in many lines of manufacture, and numerous other activities. Among them was the study of the business cycle, regarding which a report with recommendations was recently made by the high-grade committee chosen for this work. This report has been received most favorably by the iron and steel and other industries, which have warmly approved its various suggestions, among them plans to reduce the "peaks" and raise the "valleys" so that manufacturing, purchasing, employment, and consumption, would be stabilized throughout prolonged periods. It was shortly before the recommendations of the Committee on the Business Cycle were published that Secretary Hoover, responding to a request from the President, urged that in view of the present activities and full employment in the construction and related industries, the Government defer its program as a sort of reserve when there is less activity. This was the first active step in reducing the "peak" and the policy was immediately adopted by the Federal Reserve Board, which in a resolution on March 19, said that until "the present congestion in the building activities of the country is materially relieved and costs of building are lowered, the Federal Reserve banks should not add to the existing difficulties of the situation by carrying on any branch building operations other than those now in progress or for which contracts have already been entered into." It was recognized that there are exceptional activities in the building industries and that the Government could well help plane out the business cycle in these lines by withholding contracts and fall back upon them as a cushion in periods of less activity and reduced employment.

### Genuine Prosperity

But even before the Government had taken active steps in this direction, one purpose plainly being to avoid inflation, business interests themselves had been sounding warnings against over-expansion and its inevitable consequences. The result was healthy activity in the iron and steel and other basic lines, as well as in many of the minor channels of trade. Full employment and even complaints of shortage of labor developed; manufactures are entering directly into consumption, thus avoiding heavy accumulations of stocks or future large inventories that might otherwise have to be liquidated, and all in all the labor situation has been satisfactory from a point of lack of disturbances.

Commercial credit continues to be ample at reasonable rates, far below those of 1920, when industry after a period of excessive activity suffered a severe depression resulting in greater employment than ever before encountered in the United States; and the strong official intimations in Washington are that Federal Reserve bank rediscount rates are not to be increased in the immediate future. Railroads, as shown by statements of the Car Service Division of the American Railway Association, continue to break records for this time of year, in the number of cars loaded with revenue freight and the character of these heavy loadings is widespread, being applicable to various lines. In the cases of forest products, live stock and merchandise and miscellaneous freight, the loadings for the week ended on April 21 were unprecedented. At the same time, substantial progress is being made by the railroads in increasing their motive and car equipment and in improving their roadbeds and terminal facilities, and their net earnings are more satisfactory.

### May Exercise Too Much Caution

In view of the foregoing factors together with information they gather from day to day, Government officials say frankly that they are unable to assign a reason for the apparently extraordinary note of caution that is being sounded in business. They are thoroughly in accord with the spirit of conservatism sounded, but some of them are inclined to think that, if stressed too much, it might be misinterpreted and develop into excessive circumspection, that would check production and buying. The opinion has been expressed that while there have been some lines of buying that might well prove better as investments in other directions of purchases, Government officials feel that taken in general the present prosperity can be properly called healthy. After all, it is pointed out, production and consumption are reflected in miscellaneous lines, rather than being spotty and concentrated on only a few sources—one of the elements standing out in 1920 and in which year railroad buying for instance was limited. The feeling prevails, however, that despite present activities more attention should be given to export markets and that some lines are actually disregarding export contracts which will be needed later on.

It also is noted with a great deal of satisfaction that while opportunity remains for further improvement, both industry and labor are showing much more efficiency than was the case in 1920. There are exceptions to this rule, of course, such as excessive wages and indifferent labor in construction. This, it is said, is evidenced from record production figures in certain units of the iron and steel industry as well as in other lines, despite the complaint of shortage of labor.

### Eliminating Waste

The effect has been, it is asserted, to stimulate the idea of eliminating waste and of improving operations. In this connection it is interesting to observe that Secretary Hoover in furthering plans of cooperation with other business interests of the country looking to greater efficiency in their various activities, will with the beginning of the new fiscal year on July 1, set up a new division for the purpose of taking up and putting into effect the result of studies looking to the elimination of waste in transportation and economic distribution of goods. Because the appropriation for the purposes granted the Department of Commerce by Congress was only \$50,000 instead of \$100,000 which the

(Concluded on page 1381)

# Iron and Steel Imports Continue Heavy

**Pig Iron Almost 70 Per Cent of January's 120,078-Ton Total—  
Finished Steel Under 6 Per Cent—Total Exceeded in  
Recent Years Only by Last October and November**

WASHINGTON, May 8.—That good sized shipments of foreign pig iron remained to be delivered to American buyers in January is made evident from the fact that imports of pig iron in that month totaled 83,935 gross tons. They constituted the great bulk of incom-

exceeded those of the first half of 1922 by more than 57,000 tons.

Of the pig iron imports for January of this year,

	Jan., 1922	Jan., 1923	7 Months Ended Jan., 1922	7 Months Ended Jan., 1923
Pig iron .....	6,346	83,935	20,419	440,981
Ferromanganese .....	1,300	4,218	5,171	71,517
Ferrosilicon .....	1,593	902	7,828	11,489
Scrap .....	2,412	21,951	24,150	135,753
Steel ingots, blooms, billets, slabs and steel bars .....	523	2,040	8,294	19,608
Rails and splice bars ..	365	1,749	13,112	12,020
Structural shapes .....	174	233	593	6,949
Boiler and other plates* ..	.....	350	.....	1,491
Sheets and saw plates* ..	62	87	225	466
Bar iron .....	282	670	1,463	7,360
Tubular products* .....	.....	355	.....	1,233
Castings and forgings* ..	.....	116	.....	519
Nails and screws* .....	.....	98	.....	318
Tinplate .....	171	2,128	296	2,728
Bolts, nuts, rivets and washers* .....	.....	14	.....	64
Wire rods .....	178	746	665	17,742
Round iron and steel wire* .....	.....	296	.....	943
Flat wire and strip steel* .....	.....	64	.....	344
Wire rope and insulated wire, all kinds* .....	.....	126	.....	184
Total .....	13,406	120,078	82,216	715,709
Manganese ore .....	9,500	829	118,479	227,051
Iron ore .....	19,433	205,532	76,055	1,138,299
Magnesite .....	4,854	480	33,327	72,115

\*Not reported separately previous to Sept. 22, 1922.

ing iron and steel shipments for the month, whose total was 120,078 tons, of which the United Kingdom contributed 67,376 tons. For the seven months ended with January, pig iron imports amounted to 440,981 tons, out of aggregate iron and steel importations of 715,709 tons. The fact that imports of pig iron during the particular seven months under review, from July 1, 1922, to Feb. 1, 1923, exceeded the total imports of pig iron for the entire year of 1922, when they were 383,445 tons, is taken to be a reflection of heavy purchases made by American consumers of foreign pig iron after the middle of last year, largely as a result of the coal and transportation strikes. January pig iron imports

1922	Total	Pig Iron	Ferroalloys	Scrap
January .....	13,406	6,346	2,893	2,412
February .....	11,145	1,888	1,319	2,254
March .....	14,140	1,871	4,162	2,844
April .....	18,750	5,968	2,836	4,430
May .....	23,093	4,476	5,801	7,292
June .....	39,155	5,850	15,053	10,000
July .....	71,971	18,828	28,141	9,795
August .....	50,050	17,105	18,042	9,085
September* .....	76,393	46,839	14,333	12,224
October .....	175,086	120,779	11,794	28,677
November .....	141,176	98,767	6,607	25,575
December .....	96,395	54,728	6,212	28,602
Year 1922† .....	714,538	383,445	169,398	142,969
January 1923 .....	120,078	83,935	5,120	21,951

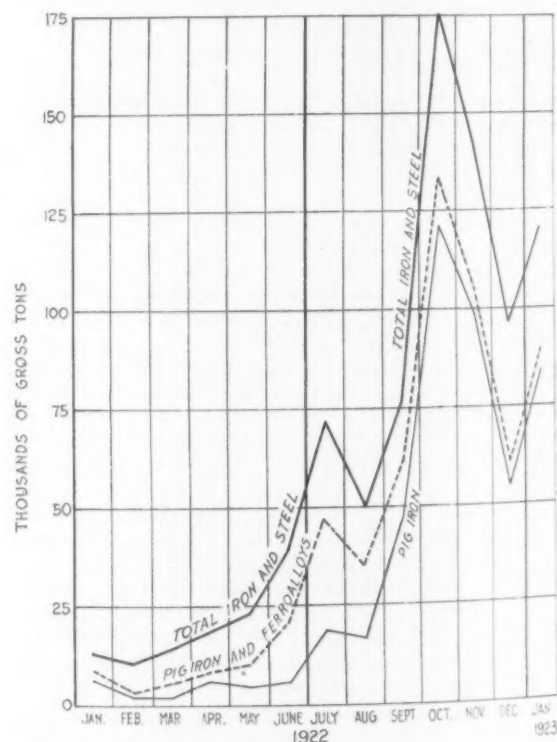
\*First 21 days only; last 9 days of September included in October figures.

†Totals do not check sum of monthly figures, because of revisions made by Bureau of Foreign and Domestic Commerce, which were not carried back to the individual months.

	January, 1922	January, 1923	Seven Months Ended January, 1922	Seven Months Ended January, 1923
Metal-working machine tools and parts....	\$19,861	\$34,187	\$101,575	\$169,460
Agricultural machinery and implements .....	107,633	198,823	401,123	1,312,633
Electrical machinery and apparatus* .....	.....	17,367	.....	94,123
Other power generat- ing machinery .....	.....	428,887	.....	967,743
Other machinery .....	221,248	158,288	2,068,072	1,432,276
Vehicles, except agri- cultural .....	127,805	93,223	1,019,245	922,378
Total .....	\$476,547	\$930,775	\$3,590,015	\$4,898,612

\*Not reported previous to Sept. 22, 1922.

44,816 tons, or more than 50 per cent of the total, came from England, with France ranking second, incoming shipments from the latter country being 19,974 tons.



United States Iron and Steel Imports for Thirteen Months

The second largest item of imports in January was scrap, the inbound movement of this product being 21,951 tons, while for the seven months' period scrap imports totaled 135,753 tons.

Imports in January nearly equaled the export movement of 129,753 tons. They were almost identical with the 120,578 tons for the whole of 1921.

Ferromanganese imports declined to 4218 tons, of which 4058 tons came from England and 160 tons from Germany. Imports of tin plate showed a surprising increase, amounting to 2128 tons, a large total for this product when compared with previous imports of recent years. January imports were credited to England and



Imports of Iron Ore  
(Gross Tons)

From	January		Seven Months Ended January	
	1922	1923	1922	1923
Spain	6,667	19,531	12,269	56,171
Sweden	.....	45,560	20,359	293,329
Canada	31	1	3,259	1,687
Cuba	10,450	88,000	36,547	392,449
Other countries	2,285	52,440	3,621	394,663
Total	19,433	205,532	76,055	1,138,299

presumably came from Wales, which is not separately classified by the Department of Commerce.

Imports of iron ore totaled 205,532 tons, of which

Imports of Pig Iron by Countries, January, 1923  
(Gross Tons)

England	44,816	Belgium	2,964
Scotland	4,951	France	19,974
Canada	5,014	Germany	6,138
British Columbia	23	Sweden	55

88,000 tons came from Cuba and 45,560 tons came from Sweden. Manganese ore imports were only 829 tons. Chrome ore imports totaled 7600 gross tons in January, 3000 tons coming from British South Africa, 2500 tons from British India and 2099 tons from Greece.

January, 1923, Imports by Principal Countries  
(Gross Tons)

United Kingdom	67,376	Germany	8,523
France	21,199	Belgium	3,699
Canada	17,061	Sweden	2,072

Imports of agricultural machinery and implements in January were valued at \$198,823, of the total machinery imports of \$930,775, which was about double the figure for January, 1922.

## More Active Plants

The Bessemer department of the Steelton, Pa., plant of the Bethlehem Steel Co. resumed operations May 1, after having been closed more than two years.

The Lochiel Furnace, Harrisburg, Pa., which has been inactive for between two and three years, will be placed in operation within the next several days. The plant now has sufficient orders on hand for foundry and basic iron to keep it in operation for six months.

After a two-year period of inactivity, one of the blast furnaces at Tonawanda, N. Y., recently acquired by a subsidiary corporation of the American Radiator Co., has been placed in blast. Archer A. Landon, vice-president American Radiator Co., in charge of operations in Buffalo plants, lighted the stack. Other officials were present. Docking facilities on the Niagara River to permit the delivery of ore are being provided for as part of the plan to produce 300 tons of pig iron per day.

## Institute Re-elects Directors

At the annual business meeting of the American Iron and Steel Institute, Monday, April 7, the directors whose terms expire in 1923 were re-elected as follows: L. E. Block, A. C. Dinkey, Elbert H. Gary, James A. Farrell, Robert Hobson, W. S. McCook and C. M. Schwab. It was voted to increase the number of directors from 21 to 24, but this action will not become effective until after filing of legal notice.

Construction of a new power generating station with 80,000 hp. capacity, is under consideration by the Pennsylvania-Ohio Power & Light Co. of Youngstown, a subsidiary of the Republic Railway & Light Co. The new plant will likely be built along the Ohio River, near Toronto, and will be linked up with a high transmission system so as to serve eastern Ohio, western Pennsylvania and part of West Virginia. The plant will involve an expenditure estimated at \$6,000,000, together with an additional \$1,000,000 for transmission lines.

## INCREASING OPERATIONS

## Additions to Employees of Many Plants—More Wage Increases

The Worth Steel Co., Claymont, Del., is making extensive additions to its working force to provide for the operation of another shift in a number of departments. Additional equipment is being placed in service, necessitating the employment of stampers, trimmers, weighers, electric crane operators, helpers, etc. The flanging department is on a double time basis, giving work to a full quota. Two plate mills and five oil-burning open-hearth furnaces will soon be in operation; the No. 1 mill is steam-driven, and the No. 2 unit, electrically operated. The Penn-Seaboard Steel Corporation is making ready for operations at its plant at New Castle, in this same district. Within the next two or three weeks, two furnaces will be placed in service, and in 30 to 60 days thereafter, three additional units will be added. It is expected to develop capacity at the plant and a working force is now being recruited. The mill has a rating of about 8000 tons of billets and blooms per month. It has been idle for several years past.

The Indiana Rolling Mill Co., Newcastle, Ind., is running full on a 24 hr. basis, giving employment to a large working force. An addition to the plant, recently completed, is now in service.

The United Alloy Steel Corporation, Canton, Ohio, is operating at close to 100 per cent, just as labor conditions will permit. Employment is being given to about 3,000 workers and a call is out for additional employees. The Timken Roller Bearing Co., another local industry, is running full with a working force totalling approximately 4,000 persons. An addition to the plant is now nearing completion, designed to give employment to about 100 operatives.

A flat increase of 10 cents an hour for metal trades workers has been made at Seattle, Wash., effective April 23. About 6000 men are employed locally.

## Strong Demand for Labor in Pennsylvania

HARRISBURG, PA., May 8.—The demand for employees in iron and steel mills of Pennsylvania, where more attractive wages are being offered, is contributing to the farm labor shortage throughout the State, according to the semi-monthly report of the Pennsylvania Department of Labor and Industry.

Plants of the iron and steel trades generally are reported to be commandeering every able-bodied man that they are able to get. Negro and Mexican workmen from Southern and Southwestern States have been transported to this State during the past month to help meet the common labor shortage, which now is believed to have reached its peak.

The Machinery Club of Chicago recently elected new officers for the coming year as follows: President, S. A. Ellicson, Chicago Pulley & Shafting Co.; vice-president and secretary, H. S. White, co-manager Cleveland Twist Drill Co. at Chicago; treasurer, H. J. Reeve, Reeve-Fritts Co.; assistant secretary, H. F. Kempe, H. F. Kempe & Co.; new directors: H. Barrett, president Barrett-Christie Co.; R. W. Barry, purchasing agent, Drying Systems, Inc.; C. Roth, president Roth Brothers; W. Slack, president Torchweld Equipment Co.; E. P. Welles, president Charles H. Besly & Co.

Cleveland foundries operating closed shops have agreed with the molders' union on a wage rate of 90c. per hr. and an adjustment of piece rates so that men doing piece work can earn \$9.60 for an eight-hour day or one-third more than the regular day rate. Foundries in Cleveland operating open shop are now paying molders 70c. to 90c. per hr., depending on ability.

Two Brassert washers have been ordered by the McKinney Steel Co., Cleveland, of Freyn, Brassert & Co., Chicago, for its River blast furnace plant.

# An Opportunity in Machinery Export

## Promoting Exports of Engineering Material Through Educating Foreign-Born Students in American Methods—Remedies for Frequent Failures

BY W. H. RASTALL\*

**A**N entirely new form of competition is developing in connection with export trade in machinery, which exposes an interesting situation and at the same time a distinct opportunity to the American manufacturer. This opportunity arises from the influence of engineering experts in these various foreign countries on the selection of machinery needed in those markets and which is now definitely recognized as a factor of real importance, while the competition arises from the efforts being made by different nations to persuade foreign students to attend universities in the interested country, in order that these budding experts may know of their methods and equipment, thus indirectly promoting sales.

To explain these conditions clearly it is necessary to review the situation briefly. Before the war Germany furnished more of the machinery absorbed in international trade than any other country, her share approximating 45 per cent of the total. The United States ranked third, supplying about 22 per cent. Conditions have since changed very much and probably this country now stands first, the volume since the armistice having varied between \$175,000,000 and \$383,000,000 per year, which approximates 20 per cent of our total production of such equipment. Clearly this trade is important. It should be added that it can be expanded greatly and made far more important, for the above totals are even now from two to six times the pre-war volume, in spite of the fact that comparatively scant effort has been made to expand this profitable business.

But in planning to expand our machinery sales abroad due recognition should be given to the persons authorized to select equipment. Experience shows that these men are strongly disposed to order machinery with which they are already familiar; a German engineer prefers German-made equipment; a British engineer prefers the British, etc., etc., so that an important element of the sales problem is that of influencing the selection of operating and consulting engineers. So clearly is this recognized abroad that in some countries diplomatic influence is brought to bear, and some of the railroad agreements in China stipulate the nationality of the engineers to be employed. It is largely because of such reasons that in 1919 our participation in the machinery trade of China was only 45 per cent, as contrasted with 75 per cent in Japan, where the trade was free from such interference.

This method of controlling foreign machinery purchases is also shown in a recent magazine article in which Lord Ronaldsby, formerly governor-general of Bengal, indicated that the best way to promote British trade in India was to "see that the capital, the business acumen and the science which India requires, and for long will continue to require, from outside for the development of her resources are provided by Great Britain." Many other illustrations might be cited, but sufficient has been presented to show the influence of the nationality of the experts upon the nationality of the equipment purchased. It should also be added that experts from non-manufacturing countries commonly show a similar bias in favor of products from the country in which they have been educated and trained, or whose products they have come to know in some other way.

But it will be remembered that, about ten years ago, the United States Government arranged with that of

China that the "Boxer Indemnity" be remitted and the funds employed for the education of Chinese students in this country. As a result many such Chinese have attended our universities. Also there has been a large attendance of Chinese not supported by this fund and it is now recognized in China that American ideas are having a powerful influence upon current affairs there. In fact, this influence is so strong as to have been called forcibly to the attention of both British and French officials and strenuous efforts are being made to induce students to attend French universities, while recently the British have remitted their Boxer Indemnity in a way similar to that adopted by our Government when John Hay was Secretary of State.

Consequently we now have international competition taking the form of appeals to students from non-manufacturing countries. The logic of the situation is shown in the following quotation from a British writer in the *China Express and Telegram* of Aug. 10, 1922.

"It has been pointed out often enough in the papers that, for every Chinese student we have in England, there are at least 100 in America and the result has been, most undoubtedly, exceedingly detrimental to British commercial interests in China. Before the war there was practically no American machinery for textile industries imported into China, and the English manufacturers had it all their own way; but since the war the American competition is becoming more and more difficult to meet, and we are constantly coming across employers, managers, and technical assistants who have been educated in America and are consequently biased toward all things American." Similarly in his last report the British trade commissioner for India testifies to the influence, on the machinery trade of India, of a handful of American engineers out there.

Foreign trade is so vital to the welfare of the nations of Europe that we may expect to see vigorous action, now that they are definitely committed to the policy of educating foreign students for the benefit of their exports. The British Boxer Indemnity approximates \$50,000,000, as contrasted with the American fund of about \$11,000,000. The number of Chinese students already taken to France is large. However, as it would appear that this is a matter in which quality is more important than quantity, the policy that should be adopted here is not one of scrambling to secure a larger number of students to crowd into our already overtaxed universities, but rather to make sure that every such foreign student is given the best possible education and training, in order that we may be sure that he is really an American engineer or physician or business man upon his return to his home country, and thereby maintain the standing and prestige of our institutions abroad.

Unquestionably American engineers and engineering are far in advance of what is known elsewhere, and we have but to give our best to these students to maintain this prestige and greatly promote our exports of engineering equipment. It should be emphasized that this is far more than a mere matter of putting a few Chinese through school. Statistics show that for the scholastic year ended June, 1922, there were 6488 foreign students of collegiate grade in our various institutions, of which 1274 were registered as studying engineering. As 1114 more were "unclassified," it

\*Chief, Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, Washington.

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ESTABLISHED 1855

# THE IRON AGE

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GEORGE SMART

Member of the Audit Bureau of Circulations and of  
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York  
F. J. Frank, *President* PRINTED IN U. S. A. George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th  
Street, New York. H. M. Sweetland, *Pres.* Charles G. Phillips,  
*Vice-Pres.* A. C. Pearson, *Treas.* F. J. Frank, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh:  
Park Building. Boston: 410 Unity Building. Philadelphia:  
1420-1422 Widener Building. Cleveland: Guardian Building.

Detroit: 317 West Fort St. Cincinnati: Mercantile Library  
Bldg. Buffalo: 833 Ellicott Square. Washington: 26  
Jackson Place, N. W. San Francisco: 320 Market St.  
London, Eng.: 11 Haymarket, S.W.1.  
Subscription Price: United States and Possessions, Mexico,  
Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year.  
Single copy 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act  
of March 3, 1879.

## Comparing This Year with 1920

In February, if not in January, it was said here and there that this year was beginning to look much like 1920. Afterward the remark became quite common. In the stock market it is a favorite practice to "copper" the predictions. The principle is simple, that when many men expect a thing the thing will not occur if it is something that men would like to avoid or something out of which money can be made.

If the majority of men believed that this year was lining itself up to behave like 1920, then they would naturally take steps to avoid any losses or inconvenience they suffered in 1920. The more 1923 looked like 1920 the more different, therefore, it would really prove to be.

While it is often remarked that men's memories are short, the remark is sometimes made for show. It is not to be taken very seriously. When men seem to make the same mistake they made before it is very probable that they think they see differences in the condition. Certainly it was hardly to be supposed that the mistakes of 1920 would be repeated.

Apart from the point whether the two years did open much the same, and granting for argument that there was precise similarity while admitting that many mistakes were made in 1920, men would not be endeavoring in the first half of 1923 to reverse mistakes they made in the second half of 1920. They would take the case month by month. In January of this year they would do things differently from the way they had done them in January of 1920, and so on month by month.

To be specific, there were mills which shipped in July, 1920, steel that they had expected to ship the previous April. Naturally they would avoid committing themselves so heavily for April of this year, knowing that they would have received more money if they had sold more conservatively in 1920. Again, there were consumers who bought prompt steel in the summer of 1920, whereas steel would have cost less if it had been bought earlier and had been delivered. One may well conclude that during the first three months of this year anyone who believed 1923 looked like 1920 would

sell less, if a seller, and buy more, if a buyer. It will be admitted such a combination would tend to produce a strong market.

Passing from the mental phases to the physical phases, there are differences between 1923 and 1920. Both years had strikes behind them, but 1920 had the iron and steel strike of Sept. 22, 1919, and the coal strike of Nov. 1 immediately behind, while with 1923 the coal strike had ended earlier than the 1919 steel strike had begun. The mills had had three months of heavy output when this year began, ingot production having been fairly steady at about 40,000,000 tons a year from Oct. 1. In the month of March the two years came together, ingot production being at a rate above 45,000,000 tons a year in each case. Now we have a divergence, for on account of the "outlaw" railroad strikes of April 1, 1920, the steel production rate decreased from March to April by 17 per cent.

The divergence in pig iron production was striking, as seen by THE IRON AGE blast furnace returns. In 1920, the March production averaged 108,900 tons a day, while the rate on May 1 was 89,140 tons, or 18 per cent less. This year the March rate was 113,673 tons and the May 1 rate 119,500 tons, or 5 per cent greater.

If one believes that there are points of similarity between 1923 and 1920, he may reasonably expect men to do things differently this year to the extent that circumstances permit. We have had free buying and conservative selling, and already one can say that the fancy priced market of this date in 1920 has been avoided. The cause for the "buyers' strike" of 1920 has not been furnished, and the prospect of continued heavy consumption of steel is better today than it was at the same time in 1920. The precise relation between this consumption and the current production, however, is not accurately known.

Decreased immigration ordinarily coincides with a poor business year. A survey made by the immigration committee of the Chamber of Commerce of the United States under the chairmanship of John W. O'Leary of Arthur J. O'Leary & Sons Co., Chicago, points this out. Of immediate in-



terest is the conclusion that the decreased immigration from the countries of western Europe in 1922, the first year of the operation of the emergency immigration law, is partly accounted for by its being a bad year economically. The smallness of the movement into Canada from Europe in the same year doubtless was due in large measure to the same cause, for Canada did not change its immigration law.

### Greater Things for the Foundry

Any organization which in three successive annual gatherings has produced a technical program and an exhibition of equipment with a combined drawing power of 3000 to 4000 participants has come to a position of leadership that has large possibilities. Such is the record of the American Foundrymen's Association, which held its 1923 meeting last week in Cleveland.

Let it be granted that the high place attained by this thriving society is due in no small measure to the expansion of the American foundry industry itself. Beyond all this is the fact that the leaders in the industry have been alive to the benefits of cooperation for the working out of their technical problems. A comparison of the subjects discussed and the products exhibited last week with some of the efforts of ten or fifteen years ago leaves a distinct impression of the magnitude of the present day industry and of the strides that have been made.

The technical programs in particular show a marked advance. Whereas a few years ago only iron, steel and malleable foundry subjects were discussed, now there are sessions on heat treating, on centrifugal casting, on foundry training, on non-ferrous practice and on sand problems, all of which have assumed large importance. There has been the criticism that the organization in its technology does not rank with the national engineering societies. But the fact is that no other convention offers a list of papers more varied or of more practical value or giving greater stimulus to progress in the art for which it stands. Both in foundry metallurgy and the mechanics of castings manufacture the contributions of the past ten years are fairly comparable with those in any manufacturing industry.

Two recommendations of the retiring president deserve careful consideration. The one advocating the employment of an additional secretary, who shall devote himself to the technical activities of the foundry world, may well prove worthy of adoption. The other, that local chapters be organized by such a secretary, in cooperation with the general officers, would work for larger cooperation and result in still greater advancement for the whole industry.

In late years the sand problem in foundry practice has been much to the front. At Cleveland last week the two sessions on sand drew the largest attendance and brought out the liveliest discussions. Proper foundry sand is almost as important as the right metal. In the past the sand for steel, gray iron or non-ferrous prac-

tice has been too often selected by crude methods. The best sands as a result are being exhausted or are becoming more and more expensive. It is vital, therefore, that new sands should measure up to certain scientifically formulated tests and that even synthetic sands should be developed. While most excellent progress has been made, as brought out last week, there remains the old conflict between the conservative and the progressive, the rule-of-thumb man and the more scientific. This was in evidence at the meetings. It was once the practice to make metal without having a chemist, to guess that it was at least good enough. Just as today each melt is carefully compounded and tested, resulting in a better and cheaper metal, so in sand the application of similar principles will result in better sands, better castings and lower costs.

### Common Sense in Business

The difficulty of regulating business has been demonstrated many times, even when the regulation has been of the sympathetic or benevolent type, and recently we have had a demonstration of the fact that it is not easy even gently to guide business in the way it should go.

Within a few weeks, many prominent bankers, as well as leading members of the Administration at Washington, have been sounding notes of warning. Business men have been advised how to escape the experiences many of them had in 1920 and 1921. Much of this advice was sound and worthy of commendation, but the question now has arisen whether the advice was not slightly overdone. As pointed out in this issue by THE IRON AGE's Washington correspondent, some apprehension has arisen that an overdose of caution has been administered, and in an address in New York, Tuesday night of this week, on "Holding on to Prosperity," Secretary Hoover refers to what he calls a distinct note of caution as to our rapid industrial recovery, which has been sounded recently. He adds that he "shared in this, but some have gone so far as to fear that we are entering a period of inflation or danger of collapse. Caution is the greatest safeguard to our continued prosperity, but caution need not be timidity nor exclusive of confidence and courage."

Secretary Hoover apparently is not taking back anything that he has said; he is merely cautioning against excessive caution. And now comes President Harding with his common sense view of things and tells the producers of peanuts that he does not intend to interfere with the prosperity in industry by reducing the tariff under the flexible provisions of the Fordney law. He says that he has cautioned the Tariff Commission that the Government does not mean to "throw a monkey wrench into the machinery at a time when we are all trying to recover fully from industrial and agricultural depression."

Such an announcement of policy business will hear gladly because it means that there will be no wholesale ripping up of the tariff this summer. Assurance of this kind will help in steering the ship of business safely. Especially to be deplored

are the attempts to play politics that at times have developed out of discussions of business conditions, in which representatives of the Government take part. We hark back to the early weeks of 1914 when on the floor of the House at Washington partisans bandied affirmation and denial of improvement in the iron trade following the publication of a "million-idle-men" sensation in a trade paper. Today there is no parallel to the efforts then put forth to make market and statistical information the pawn of politics, and it is to be hoped the present widespread discussion of influences operating in business will continue to be dictated by honesty and common sense.

### Measures of Activity

Relative to 1913 (taken as 100) activity in five important lines now measures as follows:

Pig iron production.....	142
Steel ingot production.....	162
Copper production .....	121
Coal production .....	111
Railroad freight ton-mileage .....	150

The four comparisons in production are with the actual output in the calendar year 1913. The present rate is taken, in the case of pig iron, as the rate shown for May 1 by THE IRON AGE blast furnace report, in the case of steel ingots at the rate shown by the American Iron and Steel Institute report for April, in the case of copper at trade estimate for the first quarter of the year, and in the case of coal at the weekly output of bituminous coal being shown by the Geological Survey reports. The comparison of freight ton-mileage on the railroads is made by taking the figure for January of this year and applying a factor derived from previous experience in typical years as to the relation between January and a whole year, with its seasonal variations. This is then compared with the fiscal year ended June 30, 1913.

For a proper comparison certain allowances should be made from the figures shown above. By the standard of 1913, steel ingot production is running well ahead of pig iron production, but that is not abnormal. For many years steel production has been gaining on pig iron production, for two reasons, because the production of iron castings does not increase so rapidly as the production of steel and because larger proportions of scrap come into the industry for reworking. With pig iron at 142 and ingots at 162 the iron and steel industry as a whole may be taken at upward of 150. Exports, however, instead of running 50 per cent above those of 1913, are running less in point of tonnage, and the iron and steel production factor, for domestic use, may be set at 155 to 160. Thus the shipments of the steel mills and foundries into domestic consumption are running above the freight movement on the railroads, in point of gain over 1913.

Copper production falls quite short of iron and steel production or of the general volume of freight traffic, being at 121, instead of 150 or 155. The comparison with 1913 is not unfair to copper since 1913 was a fair and normal year in copper production. The difference may be due in large

part to a difference in the character of our industrial activity.

Coal, with its relative of 111, shows proportionately much less activity than the other industrial efforts that have been considered. A little allowance should be made for the fact that there is no production of house coal at this time of year. In general, however, coal is falling behind its former performance. For a number of decades before the war, pig iron, copper and coal all showed a decided tendency to double in production every ten years. From 1876 to 1913 coal production doubled four times, the respective periods being approximately 5½, 10½, 9½ and 11½ years. Through economies we are probably using considerably less coal now than ten years ago per unit of industrial accomplishment.

A recent dispatch from Chemnitz, Saxony, told of the introduction of aluminum for stage scenery at the Chemnitz opera house. The high cost of wood is the prime cause, but it has been found that aluminum is not only lighter to handle but is not a fire menace. Another advantage is that scenery can be painted on both sides of it. The aluminum is being used in sheets or plates. It is only another case of the widening use of the light metals and alloys. The framework of the great American dirigible ZR1, now being completed, is largely of duralumin, an aluminum alloy which in the heat-treated condition has a strength equal to mild steel, combined with a lightness admirably adapted to this service. Its strength divided by its weight is said to be 200 per cent over that of mild steel. Doubtless we have only begun to see the substitution of light metals and alloys for wood and even steel. Their further perfection and reduction in cost are but a matter of time.

## CORRESPONDENCE

### Steel Consolidation and the "Rail Problem"

*To the Editor:* It seems to me that in your editorial of April 19 entitled "Small Rail Output" you are a little hard on our old friends the steel rails. Of course the last paragraph of it refers entirely to tonnage; but some may be disposed to misinterpret it and accept too literally your statement that "rails, once the great product of the steel industry, have become a minor item and undoubtedly they will remain so".

In 1881 approximately 75 per cent of the country's steel ingot production went into rails. In 1920, rails consumed as little as 6 per cent of the ingot production. Hence, the real accuracy of your statement is obvious. But I am offended by your generalization that "rails \* \* \* have become a minor item", and would ask what product, from any other standpoint than tonnage, constitutes a more important item than rails?

The transition from iron rails to Bessemer steel rails is long since past, but miles and miles of Bessemer rails remain to be replaced with heavier ones of open-hearth steel. Increasing the size of the sections and using open-hearth steel by no means have solved the problem of insuring safety and a good life to present day rails. The fact that every one carries half a pound or so of steel on his person, and at his home probably controls several pounds more, means that products other than rails are eating up steel pro-



duction faster than the railroads once did; but relatively who can dispute seriously that the *quality* of that great every-day tonnage is of near the importance of the now insignificant rail tonnage.

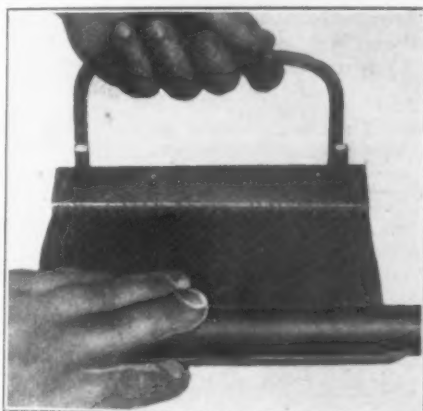
Incidentally, what has been called the "rail problem" has been helped to solution by the recent consolidations. There are now four distinct rail manufacturing companies. A few years ago there were seven. The Colorado and Inland mills are smaller producers, so that in reality Bethlehem and the Steel Corporation control the rail destiny of the country. Jointly, or even singly, their initiative could go a long way toward the development of practice that would be of immense benefit in the direction of providing rails to sustain adequately the increasing volume of traffic on the greatest transportation system of the world.

C. W. GENNET, JR.  
Robert W. Hunt & Co.

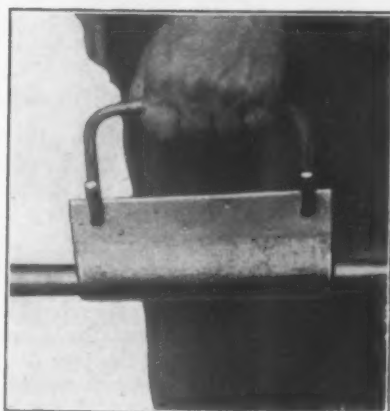
Chicago, April 30.

### Device for Carrying Round Bars

*To the Editor:* In a factory where a large number of round steel bars, 1 in. in diameter and 10 ft. long are used it is necessary from time to time to transport some of them a short distance between two departments. Obstructions make the use of trucks imprac-



Rolling a  
Bar Into  
the Curve  
of the  
Carrier.



Carrier with  
Open End  
Slipped Over  
Holes and Bar  
Ready to Be  
Moved.

ticable so the bars are carried one at a time slung in the device shown in the accompanying illustrations.

Before using this, considerable difficulty was experienced in lifting the material from the floor, it being impossible to insert the fingers between a bar and the floor near the center to procure a straight lift. Consequently the procedure adopted was to raise a bar at one end and run the hands along to grip the center. This was the cause of many cut hands as some of the bars carried sharp burrs incurred from a previous operation.

The device illustrated is made up of a piece of fabric belting cased at each end with sheet metal, these pieces being bent double and held in place by a number of pins riveted over at each side. The handle, made of 7-16 in. cold rolled steel, is bent as shown, and the ends turned up to form hooks. Holes are drilled through the sheet metal ends to suit and one end slipped over the hooks. In the upper illustration the bar is being

rolled onto the device laid on the floor; in the lower, the open end has been slipped over the hooks to close the device, and the bar raised from the floor ready to carry.

With this simple tool all danger of cut and pinched fingers has been avoided and the labor itself made far more comfortable than formerly. HARRY MOORE.

Rosemount, Montreal, Canada.

### Making Steel Without Pig Iron in Russia

*To the Editor:* In THE IRON AGE, Sept. 7, 1922, there was published an article by Edwin F. Cone, "Making Steel Without Using Pig Iron." In this article the author describes the production of tank, fire box, boiler and other grades of plate by the Central Iron & Steel Co., Harrisburg, Pa., without the use of pig iron but entirely from scrap steel and iron. The iron ore is replaced by manganese ore. Physical and chemical tests show the high quality of the steel thus produced.

The application of carbon as charcoal or hard coal in the open-hearth process instead of pig iron is not new. In Russian metallurgical practice this question was solved long ago and some of the Russian plants were then making steel without any pig iron, but entirely from scrap steel. The reason for this was that some of these plants, using expensive pig iron bought in the open market, had the alternative of buying scrap iron and steel or turnings at a lower price. Such plants are the Putiloff Works, Petrograd, and the Riga Steel Works. The process was carried out in these plants by M. S. Pautoff, mining engineer, and Mr. Starobogatoff, engineer.

References to the use of coke and charcoal for carbonizing the bath in the open-hearth process appeared long ago in technical publications. Thus, in 1890, Mr. Pezczolka in Germany took out a patent on making steel in the open-hearth furnace with insufficient quantity of pig iron and carbonizing the bath by using graphite, coke, hard coal or charcoal. But this method was not generally adopted.

Mr. Naske describes (*Stahl und Eisen*, 1907, No. 6, p. 191) a successful experiment of running open-hearth process entirely on scrap iron and bricks of Caucasian manganese ore, coke and tar, with the addition of a quantity of sand to the charge.

In the Riga steel plant, steel has been produced in 25-ton open-hearth furnaces partly from their own, but mostly from purchased scrap iron, without using pig iron, but with the addition of charcoal and sometimes of coal. The charcoal used was frequently of poor quality, useless for other purposes, dusty and containing a quantity of small coal, which increased the charge necessary. The bottom of the furnace was covered with charcoal and then loaded with limestone and scrap iron.

The amount of charcoal was 5 to 6 per cent of the iron charge and about 8 per cent in the case where the charcoal contained a considerable quantity of dust. The experiment showed that the expense of charcoal powder was higher than that of lump coal. The reason is that a part of the powder burns unproductively and another part is carried away by the gases. The chemical test after the smelting of the charge shows that the latter contained about 2 per cent of carbon, so that the bath differed from the usual bath in the pig iron process only by containing manganese and silicon. Deficiency of manganese produces a vigorous oxidation of the iron dissolving as FeO in the metal.

To avoid this and to get rid of the sulphur, manganese as ferromanganese or manganese ore is used. Mostly manganese ore was used and the amount of it was ordinarily about 2 to 3 per cent; it rarely reached 4 per cent. In the end of the process about 1 per cent of ferromanganese was introduced into the bath to deoxidize the metal.

Iron produced in this manner contained: C, 0.08 to 0.12; Mn., 0.40 to 0.60; P., 0.015 to 0.06; S., 0.04 to 0.08 per cent and traces of silicon. When producing steel the amount of manganese was raised to 0.70 per cent. When the quantity of slag was not sufficient, sand was added to the charge.

Physical tests, as Mr. Starobogatoff informed me, gave for mild iron: Ultimate strength, 33 to 38 kg. per sq. mm.; elongation, 34 to 36 per cent. For spring steel: ultimate strength, 78 to 93 kg. per sq. mm.; elongation, 19 to 12 per cent; reduction of area, 44 to 42 per cent.

The percentage of metal yielded was about 85 per cent of the iron charge in case of very dirty, rusty scrap iron, with sand and sometimes with snow and ice, and 89 to 90 per cent in the case of good scrap.

There is no doubt but that the coal serves not only as a carbonizer of the bath, but that it also reduces iron, as can be seen by the content of iron in the slag, which does not exceed the percentage in the pig iron process.

In the same Riga steel works the process was also conducted in another way, without the use of manganese ore but with the addition of 0.75 to 0.80 per cent of ferromanganese after the melting of the charge. This method was as successful as the first one, and the expense of ferromanganese, which was added finally to deoxidize the metal, decreased.

The carbon and scrap process in the Riga steel plant was constantly used for some years. From time to time the process was used in the Putiloff works, but with addition of 10 to 15 per cent of pig iron scrap just to utilize it. The results were also quite satisfactory.

Mr. Starobogatoff, during the war, presented before the Russian Metallurgical Association a report of the carbon and scrap process and the question was discussed from different points of view. It appears that both iron and steel produced by this process are not any worse than the metal produced by the ordinary scrap process and that they can be used for most purposes, not excepting artillery.

During the revolution, the writer published in the *Trade and Industry Journal* (1918, No. 73) an article discussing the importance of preserving scrap and borings, as future material for the production of iron and steel in the carbon and scrap process, the only possible method in the revival of the industry in this country, until enough pig iron should be made. The author offered also some reports on the same topic to different Government institutions in 1919 to 1921. As a result the carbon and scrap process was put in operation in the Putiloff works.

The application of manganese ore in the open-hearth process is also not new. Mr. Schelgounoff communicates in the *Mining Journal* (1904, No. 1, p. 103) his experiments in the Soulsinsky works, where he used manganese ore for eliminating sulphur. Mr. Riemer, an assistant of Mr. Schelgounoff, briefly describes the same experiments in the *Stahl und Eisen* (1902, No. 24, p. 1357).

These experiments were made on account of the accumulation of more than 8000 tons of very bad pig iron, containing 0.15 to 0.50 per cent sulphur. By using manganese ore instead of iron ore, Mr. Schelgounoff succeeded in converting all this pig iron into iron containing 0.05 to 0.08 per cent of sulphur or ordinary iron.

This information tends to show that the carbon and scrap process with manganese ore and the using of manganese ore for elimination of sulphur in the open-hearth process, are not new and were used in Russia from the beginning of the present century.

W. LIPIN,

Professor and dean of the metallurgical faculty of the Mining Institute, Petrograd, and president of the Russian Metallurgical Association.

Dec. 11, 1922. Wassily Ostrow, 21 line, 2 Petrograd, Russia.

### Bliss Co. Consolidates Brooklyn Plants

Practically all of the machine equipment from the Adams Street works of the E. W. Bliss Co. has been moved to the South Brooklyn plant of the company. The sales and executives offices also are now at the latter plant. A shop and foundry of the Adams Street works will be operated, but other parts of the works will be placed on sale.

During the war large additions were made to the South Brooklyn plant, and at the termination of hostilities a considerable amount of space and equipment were available. It was determined that the consolidation of the company's Brooklyn plants offered decided advantages, and the equipment moved from the Adams Street works is using space made available by the dismantling of the special machinery installed to meet war requirements.

The South Brooklyn plant is located at the foot of Fifty-third Street, on the east shore of upper New York Bay, and comprises a group of 17 buildings covering a ground area of 18 acres, and a total floor area of 21 acres. It has a water frontage of 390 ft., on which there are two piers, one being 200 ft. long and 80 ft. wide and the other 575 ft. long and 60 ft. wide. The plant is 5 ft. less than one-half mile long. At one end there is a three-story machine shop, 320 x 200 ft., constructed in the form of a hollow rectangle, the court of which, 200 x 80 ft., is used as an erecting shop, while the balance of the building is used as a machine shop. The erecting shop is served by a number of electric traveling cranes and auxiliary hoists. On either side of the building are 5-ton cranes to serve the planers and lathes.

Next in order is the hydraulic forge shop, which is a one-story building 125 ft. and 200 ft. wide, and is served with two 10-ton and one 30-ton overhead electric traveling cranes. The equipment in this shop consists of furnaces, steam hydraulic forging hammers and forging presses ranging from 200 to 1000 tons pressure. The water supply and pressure is obtained by eight hydraulic pumps, each being driven directly by one 350-hp. General Electric motor, which

in turn supplies two 16 in. 200-ton accumulators. The pumping equipment is controlled by an automatic switchboard which is operated by the position of the accumulators. Adjoining the forge shop is the automobile die department, a one-story concrete building 200 x 180 ft. A storage yard, having a railroad siding completes the space in the block between Second and First Avenues. This yard is used chiefly for loading and unloading of cars serving the group of buildings described, a 5-ton locomotive crane being installed here.

On the far side of First Avenue is a one-story brick and steel building 320 x 200 ft., which is fitted with skylights to give an ideal lighting condition. Between this and the seven-story building at the center of the group are various minor buildings which are used for plating, pickling, grinding, and small tool houses, also two 100,000-gal. fuel oil storage tanks. This is the primary supply of oil for the boilers and furnaces used throughout the plant and is fed by a main line running from the pier to these tanks, so that they may be filled directly from the barges.

Prominent in the rear of the group is the seven-story machine shop and erecting shop. The machine shop itself is a brick and steel building 380 x 60 ft., and the first two floors are served by five-ton overhead electric travelers, both the lower stories having been made high enough to accommodate these tools. The entire building is used for manufacturing purposes. To the left and adjoining this building is the main erecting shop, having an 80 ft. span and being 380 ft. in length with clear overhead distance of 50 ft., and in which are housed all of the large planers up to and including those having 12-ft. capacity and 26-ft. stroke. The main erecting floor and the machine tools are served by four overhead electric travelers, two of 50-ton and two of 30-ton capacity, each equipped with auxiliary hoists.

Beyond this building and up to the bulkhead line is the main foundry, which is 240 ft. long and 180 ft. wide. The foundry obtains its iron from two 84-in. and 54-in. diameter cupolas. The equipment includes three core ovens 20-ft. wide, 30-ft. deep and 10-ft.



high, oil fired, sand mixers, jolt ramming machines and four-ton wall travelers. In the center of the foundry there is a pit properly waterproofed, 60-ft. long, 14-ft. wide and 10-ft. deep, which is used for making deep castings. This foundry being built at tide water level, it was necessary to construct such a pit to exclude water from the molds. A line of buildings on the right, extending about a half block, begins about half way between Second and First Avenues with various minor shop buildings, including a garage having an area of 10,000 sq. ft.

Crossing First Avenue on this block are housed various activities including blacksmith and drop forging shops, pipe shop, lathe department, machine shop, coppersmith shop and various other general machine working departments. In the foreground is the steam power plant and high pressure air equipment, also a salt water pumping station, which gets its supply from New York Bay from a 36-in. main. Salt water is used for condensing purposes and flushing and cooling throughout the plant. This station also includes one 1000 gal. electrical and one 1000-gal. steam fire pump which is connected to the sprinkler systems throughout the entire plant. For fire supply the pumping capacity is equivalent to 5000 gal. per min. The fire system is further provided with two four-way Siamese connections on the pier bulkhead for connection with fire boats.

### Tax Bill Would Affect Pennsylvania Industries

HARRISBURG, PA., May 8.—The proposed manufacturers' tax bill, now in the Pennsylvania Legislature, in which iron and steel mill owners of the State are widely interested, would bring into the State Treasury a total of \$14,657,410.56 annually, according to records in the office of Auditor General Samuel Lewis.

The bill, which was introduced into the House of Representatives by Representative Stark, provides for a four-mill tax, but there has been talk of reducing the rate to three mills or less. The bill is now in the hands of the House Ways and Means Committee. Legislative observers are saying little as to the bill's chances for passage, for the legislature just now is in an almost hopeless muddle in an effort to solve the taxation problem necessitated by the State's needs for a \$200,000,000 increase in revenue for the next two years.

The records of the auditor general show that there is \$3,664,352,638, now exempt from taxation, invested in manufacturing plants in the State, which would be affected by the measure. Of this \$3,015,934,470 is on domestic manufacturing companies, while \$618,418,612 is invested in foreign companies.

Philadelphia and Allegheny counties have the largest investments, with Allegheny leading with \$1,255,422,699; Philadelphia has \$1,173,779,254. The total is \$2,429,201,923, or two-thirds of the total amount invested and exempt from tax in the State.

### Large Number of Crane Awards in the Chicago District

CHICAGO, May 8.—The Denver & Rio Grande Railroad, through Battey & Kipp, Inc., consulting engineers, has purchased 14 cranes and a large transfer table from the Whiting Corporation, for installation in the Western shops at Denver, Colo., and Salt Lake City, Utah. The list included four 120-ton, six 15-ton and four 10-ton electric traveling cranes and one 100-ton transfer table.

The Whiting Corporation has also received awards of a 25-ton electric traveling crane for Beadstown, Ill., from the Chicago, Burlington & Quincy Railroad, two 100-ton locomotive hoists and one 80-ton coast hoist from the Atlantic Coast Line Railroad and a 5-ton electric traveling crane from the Morden Frog & Crossing Works, Chicago Heights, Ill.

### Mahoning Valley Plants Still Very Active

YOUNGSTOWN, May 8.—Plans are being developed by the Trumbull Steel Co., Warren, to start its 10-mill Liberty plant at Leavittsburg, producing tin plate. For three months the property has been idle. Third quarter business is coming forward in such volume and at such prices as to make operation of this plant profitable. Labor shortage is retarding full operation of the Canton tin plate plant of the Falcon Tin Plate Co., Niles, Ohio.

In April, the blast furnace at Warren of the Trumbull-Cliffs Furnace Co., produced an average of 721 tons of hot metal daily, 20 per cent above its rated capacity. While this average is below the record production set up this year by the stack, it represents a very steady production.

In the Mahoning Valley, this week's operating schedules provide for 98 per cent production of steel plants, 94 per cent of blast furnaces, 95 per cent fabricating plants and virtually 97 per cent of sheet mill capacity.

The Struthers Furnace Co. will start about May 25 its stack, now idle for relining and repairs.

Operations in the Youngstown district now embrace:

Forty of 46 blast furnaces and three stacks under preparation.

Forty-nine of the 51 independent open hearth furnaces and 30 Steel Corporation furnaces; eight Bessemer converters.

Of the 125 sheet mills, 124 were scheduled, including those operated in the district by the American Sheet & Tin Plate Co.

Sixteen of the 17 tube mills.

Twenty of the 21 bar mills.

Ninety Steel Corporation tin mills and 19 independent units.

All skelp mills; eight strip mills and all but one plate mill.

Galvanizing departments of Valley plants are retarded to a large extent owing to the labor situation, while puddle mill operations are held down to 75 per cent because of scarcity of skilled operatives.

## COMING MEETINGS

### May

**National Pipe and Supply Association.** May 15 to 16. Convention at Cincinnati. George D. McIlvane, 909 Oliver Building, Pittsburgh, secretary.

**American Iron, Steel and Heavy Hardware Association.** May 15 to 17. Annual convention, Drake Hotel, Chicago. A. H. Chamberlain, Marble Bridge Building, New York, secretary.

**National Association of Purchasing Agents.** May 15-19. Annual convention, Cleveland, Ohio. H. R. Heydon, 19 Park Place, New York, secretary.

**National Supply & Machinery Dealers' Association, Southern Supply & Machinery Dealers' Association and American Supply & Machinery Dealers' Association.** May 17 to 19. Triple convention, Hotel Sinton, Cincinnati. F. D. Mitchell, 1819 Broadway, New York.

**American Iron and Steel Institute.** May 25. Hotel Commodore, New York. E. A. S. Clarke, 40 Rector Street, New York, secretary.

**American Society of Mechanical Engineers.** May 28 to 31. Spring meeting at Montreal, Quebec. Calvin W. Rice, 29 West Thirty-ninth Street, New York, secretary.

### June

**American Society for Steel Treating.** June 14 and 15. Spring Sectional meeting, Hotel Bethlehem, Bethlehem, Pa. W. H. Eisenman, 4600 Prospect Avenue, Cleveland, secretary.

**American Society for Testing Materials.** June 25 to 29. Annual meeting, Chalfonte-Haddon Hall Hotel, Atlantic City. N. J. C. L. Warwick, 1315 Spruce Street, Philadelphia, secretary.

## SELL SOME SHIPS ABROAD

### President Farrell Wants Co-operation with Foreigners on Shipping Problem

NEW ORLEANS, May 4.—An address by President James A. Farrell of the United States Steel Corporation on "The Shipping Situation of the World" was the feature of today's closing session of the tenth annual convention of the National Foreign Trade Council. Mr. Farrell has been chairman of the council from its organization.

#### Germany May Take Third Place

Mr. Farrell reviewed the course of world shipping since the armistice and pointed to the rapid recovery of the German merchant fleet as the outstanding fact. Since 1918 Germany has built about 1,500,000 tons of new ships and today is probably in fifth place in ship ownership among the trading nations, with the probability that continuance in her present course will bring her into third rank within a comparatively short time. Going at length into the history of American shipbuilding and ship operating during the war and since, Mr. Farrell ably analyzed the situation developed under Shipping Board management and then turned to a consideration of what can be done for the future. The Shipping Board now has in operation on certain trade routes vessels which carry nearly the volume of 50 per cent that has been set as the percentage of our freight we should carry under the American flag. The board has been losing \$50,000,000 a year, or about half the value of the cargo ships operating, basing this on the board's figure of \$30 a ton. Mr. Farrell suggests that as before the war 90 per cent of our business was carried in foreign bottoms, in order to get our carrying trade up to the 50 per cent desired we must either take that much more business or cooperate with foreign lines.

#### Sell Ships to Foreigners

It should be obvious that the losses of operation of American ships come not from a surplus of modern ships, but from a lack of cooperation on the part of all owners, foreign and domestic, to stabilize a business in which all are suffering. I am confident our foreign rivals would recognize the desirability of cooperation by all maritime countries in disposing of obsolete tonnage and deciding on the amount of tonnage to be used in the market, so as to balance the supply of ships with the demand, thereby stabilizing rates not merely to the advantage of the operators, but even more to the advantage of the traders of the world.

There is an opportunity for a trading relation. The board admittedly has many more ships than it hopes or needs to sell to Americans. Retain sufficient for our needs, and sell to foreigners the surplus. Internationally there can be built a basis for the sale of the board's ships at the world's market price in a manner that will give to the American ship owners a paying basis on the volume of trade they seek. The board would be in position to say to the American company in a given trade route:

"Cooperate with the foreign lines now competing

with you; furnish one-half of the tonnage required to move the freight over a particular route; each to act as loading and discharging agent for the other; each plan which ships of the two companies will operate on an alternate schedule, and thus will receive an equal portion of the business moving in both directions. In brief, replace unbusinesslike competition with sound cooperative operations; which will substitute profits for losses, and will demonstrate to the American investor the advantage of owning shares in American ships, particularly at the low market prices prevailing today. The Shipping Board to sell to the American company the ships required for his share, and sell to the foreign company such ships as may be required for his share. The price of the ships to be the same to each."

The foreign line would receive the advantage of replacing obsolete ships with modern ships at a fair price; they would know within reason the elements with which they and their American partner would have to contend; they would know that they would no longer have to match their reserves against those of the United States Treasury, and best of all, the available ships would be leveled down to the number the world trade requires, through scrapping such of the Shipping Board fleet as is obsolete and the scrapping of such foreign tonnage as is in a similar condition.

Mr. Farrell holds that our shipyards should receive every encouragement to keep them active and up to date; that the installation of internal combustion engines in a large number of merchant hulls would prove a stimulus to our shipbuilders, compensating them in some measure for the losses occasioned by diminished naval construction.

#### Private Operation the Goal

"The clear purpose of the act of 1920 was to develop our fleet under private ownership and operation. Already considerable progress has been made. Private American ship owners owned, on April 1 last, a total of 5,962,133 tons, gross register, of ocean-going shipping. This is exclusive of 2,723,857 gross tons employed on the great lakes. On that same date the Shipping Board owned 7,169,717 tons, gross register, of which probably one-third is fit only to be scrapped. . . . The suggestion recently made that the Shipping Board should engage in the direct operation of its vessels is contrary to the spirit and purpose of the act of 1920, and fraught with danger to the merchant marine."

In conclusion the speaker argued that the greatest subsidy our ships could have in the overseas trade would be the support of the American people. "We shall not have a successful American merchant marine unless its ships are more largely used by American shippers." With this suggestion Mr. Farrell coupled, as equally important, the necessity of our Government's establishing friendly relations with foreign shipping in order to enable our ship owners to share in inward cargoes which are necessary if our merchant marine is to have that measure of success which will make it permanent.

## LOWER RATES PROPOSED

### Important Recommendations as to Shipments of Iron and Steel Products to Tennessee

WASHINGTON, May 8.—Considerable revision and reduction in rates on iron and steel products from the Cincinnati and Ironton, Ohio, and the Pittsburgh and Buffalo districts to points in Tennessee will be made by the Interstate Commerce Commission if it approves the recommendation in a tentative report of Examiner J. P. McGrath made public today.

The findings are the outcome of complaints made by the Traffic Bureau of Knoxville, Tenn., and the Manufacturers' Association of Chattanooga, Tenn. The examiner recommends the following rates per 100 lb. for the future: On special iron and steel articles which include boiler tubes, structural material, iron and steel bars, wrought iron and steel pipe, steel plates and rivets from the Cincinnati district to Knoxville, 27c.; on tin plate, 29c.; on so-called special list steel

products named and on nails from the Ironton district to Knoxville, 32c.; on special iron and steel articles and tin plate from the Pittsburgh district to Knoxville, the same as the rate to Nashville; on special iron and steel articles from the Buffalo division to Chattanooga, Tenn., 52c., and one the same articles from Pittsburgh to Chattanooga, 52c.

The report also held that the rates from the Pittsburgh district to Knoxville and from the Buffalo and Pittsburgh districts to Chattanooga are unduly prejudicial to Knoxville and Chattanooga and unduly preferential to the extent that they exceed rates which bear the same percentage relationship to rates on the same commodities from the point of origin to Memphis as the first-class rates from such points to Knoxville and Chattanooga bear to the first-class rates to Memphis. Reparations awards were made in a number of instances, but the examiner said that in view of the proposal of the railroads to make readjustment of rates to and from the Southeast to comply with the long and short hauls provision, the fourth section departure would be eliminated.



## SELECTIVE IMMIGRATION

### Secretary Davis Gives His Plan for Admitting Foreigners of High Grade

WASHINGTON, May 8.—The giving of every child a high school education and a trade has been fixed by Secretary of Labor James J. Davis as his ideal, whose attainment, in his opinion, would assure to America the artisans and craftsmen she needs without throwing open her gates to half the world in the hope that among the miscellaneous assortment "that comes to us we may find a few to fit our needs." It is the position of Secretary Davis that it is the task of the United States to raise the standing of the ancient trades and crafts to restore dignity to manual labor. He maintains that it is the duty of those in authority to see to it that the American boy, wherever he may be, is given an opportunity to learn the life-sustaining trades and crafts while he is acquiring the academic education which the laws require him to have.

The Secretary of Labor has been emphasizing these points and brought them out clearly in a recent address at a Moose convention at New Martinsville, W. Va. He has been stressing the fact that proper education and training of American boys is one of the outstanding solutions of the problem of labor supply and is vigorously opposed to letting down the immigration bars.

In this connection Secretary Davis said: "There is today among certain groups in our national life a persistent clamor for the lifting of the restrictions which the law has imposed upon immigration. There is a continuous agitation for more immigration to meet what some employers choose to regard as a labor shortage. Immigration figures indicate that we are not getting through immigration the classes of workers that these employers declare they need. I know that we have been getting many immigrants whose mental, moral and physical make-up is a distinct menace to the political, economic and social life of the Republic, and I will oppose any movement which seeks to continue or enlarge the importations of this class of aliens."

#### A Popular Fallacy

"But the fallacy popular among some that there is always waiting at our gates just the kind of labor we happen to need ready to come in and serve, will lead us to no good. It points the way to destruction. Europe today is not a storehouse of pick and shovel men upon which we can draw at need. A large proportion of immigrants coming to America are in no sense enthusiasts for manual labor. They are no fonder of earning their bread in the sweat of their faces than the native American or any other human being. We cannot meet this problem by the artful argument that the native American is being bred away from work with his hands and that we must draw on immigration to fill his place."

"It may be true that today in America the youth of the race is reluctant to work with his hands. If it is true it is the result of our system of education, which has given to our younger generation false standards of life. It is the result of too much of the classical and too little of the practical in our schools. It is the result of a plan of education which turns out 100 per cent of our youth equipped to enter the so-called white collar professions, and firmly imbued with the belief that work with the hands is menial and degrading. But you will not solve this problem by continuing to import from the rest of the world men of low standards of living to do our actual work. That way lies national destruction. Pressed to its ultimate result, it would bring us to the point where we would have a nation of clerks and professionals upraised upon a substratum of alien labor. Such a nation could never endure."

#### Demand for Frankness

"Let us be frank about this matter of immigration. We all know that behind a great deal of this clamor is the desire on the part of certain employers who do not know the facts not to fill a labor shortage, but to secure cheap labor for their own use. They trust to a general influx of aliens to glut the labor market, and enable them to beat down wages, to fix the day's pay

in the light of a hungry crowd at the factory gates. Even if the flood of immigration would bring them this cheap labor, I say to those employers that they would be cutting their own throats. They are endangering the whole prosperity of America in an effort to make a temporary profit. They are gambling that they can hold their labor cheap, while all other labor maintains an American standard of living. I maintain that it cannot be done. When you begin to cut down the wages of the American workman by putting him in competition with a cheap labor from other lands, housed in a hovel and living on a crust, you are striking at the very foundation of American industrial prosperity. For the forty million gainfully employed in America, whose wages make up the vast bulk of the Nation's buying power, are the very basis of our industrial system. I know something about this, for I was born in the home of a workman in Europe—a highly paid one, too. Take out of the home of the American workman the comforts which he now buys, and which are unknown to the European who does the same work, halt the demand for furniture, for stoves, for carpets, for the thousand and one things that make every day's life enjoyable to the American workman, and you have brought down to destruction all of the industries which today supply the workman with those articles. Cheap labor in America means a cheap America. Do we want it? You can read the answer in the towering chimneys of industrial plants that fret the skylines of our American cities. America can never be a cheap country."

#### Selective Immigration

Secretary Davis explained his proposal for selective immigration which, he says, would permit the entrance to the United States of only the individuals who will prove a distinct asset to the country. He pointed out that the selections will be made by American officials abroad before the immigrants left their native lands, thus saving them the expense and time in connection with the ocean voyage which they must now make to test their eligibility for admission to this country. Coupled with this, Secretary Davis proposes the enrolment of the aliens upon their arrival and he would also have an annual census taken of the alien population. This would be done, he said, in order that help could be extended to the alien toward knowing America, its aims and ideals, so that he could become a good citizen, but at the same time Secretary Davis would provide that the alien who clearly demonstrates his unfitness for life in America should be deported.

### To Electrify Virginian Railway

To increase its traffic capacity and secure important operating economies, the Virginian Railway has decided to electrify 213 miles of track between Roanoke, Va., and Mullens, W. Va. This will cost \$15,000,000, covering electric locomotives, power house, transformer stations and other apparatus. The contract awarded the Westinghouse Electric & Mfg. Co., East Pittsburgh, forms the largest railroad electrification contract ever placed. The division involved crosses the Allegheny Mountains. The alternating current, single-phase system will be used.

It is expected that the new electric locomotives will develop 20,000 hp. per train, enabling them to haul 9000-ton trains up the prevailing grades at 14 miles per hour, with possible future increase to 12,000 tons capacity. The present operation over the heavy grades is performed by coupling together three large articulated Mallet locomotives of 7000 hp. combined. This combination is moving 5500-ton trains at 7 miles per hour.

Clement A. Hardy, Clement A. Hardy Co., consulting engineer, Chicago, will deliver an address on "Travel of Materials in the Foundry" before the Chicago Foundrymen's Club, Saturday evening, May 12, at the City Club, Chicago. His talk will be illustrated by stereopticon slides. Mr. Hardy was consulting engineer in charge of the design and construction of the large foundry of Fairbanks, Morse & Co. at Beloit, Wis.

## MORE EXPORT INQUIRY

### Japan and South America More Active—Cuban Buying Increases—Foreign Pig Iron Offered

NEW YORK, May 8.—A slight improvement seems evident in the volume of inquiries from Japan. South American markets and Cuba are reported to be showing greater activity, particularly the latter, which is enjoying considerable prosperity as a result of the sugar market. At present Japanese inquiry seems to be centered largely upon tin plate in lots ranging from 1000 to 4000 boxes or more. An export house which recently booked a fairly large tonnage of tin plate for the Nippon Oil Co. has received an additional 1000 boxes and is now figuring on inquiries totaling 5700 boxes; one for 2000 boxes of 14 x 20 and another for 3700 boxes of oil can size. Another Japanese export house is quoting on 1000 boxes, and there is an additional inquiry for 4300 boxes.

Assuming that there is no duplication in these tenders, there is at least 11,000 boxes of tin plate being inquired for by Japanese buyers at present. Black sheets are beginning to enter into Japanese inquiry again, and one large exporter to Japan has recently booked an order for 100 tons of fairly heavy gage galvanized sheets, an unusual purchase in view of the heavy duty imposed by the Imperial Government on galvanized sheets as a protection to the galvanizing industry.

Wire also is showing some activity. There are a number of small inquiries for annealed and galvanized wire ranging from Nos. 8 gage to 22 gage. There is also some interest shown in heavy structural material, such as H and I beams. Much of the sheet business at present is evidently still going to British mills, and it is reported that Belgian sellers are again in the export market, quoting bars, c.i.f. Japanese port, at \$57 to \$60 per ton.

The two recent tenders of the South Manchuria Railway Co., each for 5000 splice bars for 80-lb. rails, one calling for A.S.C.E. and the other for A.R.A. specifications, are reported to have been awarded to the New York offices of two different Japanese houses.

The foreign pig iron situation, from the viewpoint of the American importer, is evidently improving, and offerings of foreign iron are increasing, largely from France and Great Britain. As yet, prices are too high to prove attractive to American consumers, but there is evidently a downward tendency in both French and British quotations. An interest in New York that has imported considerable Continental iron in the past recently was offered French foundry grade at 500 fr. per ton, f.o.b. Antwerp, which, at the present rate of exchange and a \$3 per ton freight rate to an Atlantic port in the United States amounts to between \$36 and \$37 per ton or a little more, duty paid. Following this quotation, a lower price of 470 fr. per ton was offered on the same grade, or a little more than \$35 per ton, duty paid, c.i.f. Atlantic port. A consumer of foundry iron reports that he was recently offered a tonnage of pig iron rather high in phosphorus at between \$31 and \$32 per ton, c.i.f. Atlantic port.

In line with these French quotations is the current offering price of Scotch foundry iron, some small tonnages of which are reported to have gone to Pacific Coast consumers recently. A New York importer is offering prompt shipment on small tonnages of Scotch foundry iron with an analysis of 4 to 5 per cent silicon; 0.05 per cent sulphur; 0.3 per cent phosphorus; and 1 per cent and less manganese, at \$34 per ton, c.i.f. Boston, New York or Philadelphia, duty paid. Importers are watching the Continental and British markets closely in view of the greater availability of tonnages and the feeling that lower quotations may result.

The manganese ore market is inactive, with little or no Brazilian or Indian ore offered and only limited tonnages of Caucasian manganese ore available at 48c per unit for washed and 43c per unit for ordinary.

## RUHR COKE MOVEMENT BETTER

### French Market Improves—Consumers, Foreseeing Lower Prices, Buy Only for Immediate Needs

PARIS, FRANCE, April 20.—The efforts of the French authorities to increase shipments of Ruhr coke have finally been successful. From April 1 to April 16, inclusive, 33,400 tons of coke from the Ruhr passed through Ehrang on its way into France, the tonnage moved on April 16 being about 3500 tons. At present about 6000 tons of coke per day is being shipped. The authorities expect to increase the movement to about 10,000 tons, but it is not thought that that tonnage will be exceeded. Of the total shipments 10 per cent goes to Belgium and about 25 per cent to Luxemburg. Prior to the occupation, France alone received from the Ruhr 12,000 tons of coke per day.

The first consignments of American coke have been received at Antwerp. As was apprehended, the bottom of the cargoes was dust and small pieces. However, it will be possible to use that coke in the blast furnaces mixed with other kinds. It is generally objected that the c.i.f. price of \$17 per ton is too high, particularly as it must be increased by about 25 fr. for transportation from seaboard to the blast furnaces.

Belgian coke is beginning to arrive in accordance with the agreement of March 1, stipulating an exchange of coke for scrap; but the quantities received are still insignificant. The price of this coke has just been fixed at 223 fr., Belgian ovens, which is the price for Belgian coke made with foreign coking slacks. Large shipments of British coke continue to come in but its quality is not always of the best and the price is still 70 s., c.i.f. port. There was a rumor a few days ago that the British Government intended to restrict coke exports, but there has been no confirmation.

From Feb. 26 to March 25 France imported the following quantities of coke:

	Metric Tons
Great Britain .....	55,242
Belgium .....	18,431
Germany .....	24,924
Holland .....	26,830
Czecho-Slovakia .....	1,443
Saar Territory .....	54
Total .....	126,924

The improvement in coke arrivals has resulted in a few blast furnaces being relighted, and iron and steel prices, which until the end of March had been steadily rising, have now begun to decline as a result of consumers deferring their purchases. However, present prices probably will not go much lower; raw materials continue high-priced, and a big demand is expected from the building trades this summer.

**Iron Ore.**—Sales of iron ore are improving with the increase of operation in blast furnaces, but stocks are still considerable as exports are restricted. The price of iron ore from the Briey district, 32.5 per cent iron, has been increased to 16.25 fr. per metric ton. Negotiations have been resumed with British consumers of ore in the Cleveland district, and it is hoped that the result this time will be satisfactory. Similar offers made to American ore consumers have been without result.

**Pig Iron.**—While there is no available supply of basic pig iron reserved exclusively for steel works attached to blast furnaces, there is some foundry pig iron which is being quoted on a base of 480 to 500 fr. at furnaces for chill-cast foundry pig iron No. 3 P.L., as low as 475 fr. for May delivery having even been accepted by some sellers. British Cleveland pig iron No. 3 has been offered recently at 475 to 500 fr., f.o.t. French Channel ports, duty paid. Hematite is quoted as low as 500 fr., furnace, in the East of France (Hauts-Fourneaux de Pompey); but furnaces of the



North and Southwest are quoting as high as 530 to 540 fr. British East Coast hematite mixed numbers have been offered at 540 fr. delivered in the Parisian area.

**Ferroalloys.**—Ferroalloys continue high as a result of the cost of coke and the high price of turnings. Prices of the high grades of ferrosilicon were not reduced on April 1, and the price of 25 per cent Si. was increased by 50 fr. to 800 fr. per ton. Prices of ferromanganese and of silico-manganese reflect the high prices of manganese, supplies of which are almost entirely controlled by British interests. Prices quoted are:

	Per cent Si.	Per cent Mn.	Per Metric Ton Fr.
Silico-spiegel	10 to 12	18 to 20	870
Silico-manganese	20 to 25	50 to 55	1,325
Silico-manganese	20 to 25	60 to 65	1,450
Ferrosilicon:			
25 per cent Si.			800
45 per cent Si.			1,060
75 per cent Si.			1,750
95 per cent Si.			2,400

These prices are delivered at consuming works for quantities of more than 10 tons, or at producing works for smaller lots.

**Semi-finished Steel.**—With the increase of production still very slow, there is as yet practically no available supply of semi-finished material. Considering that when pig-iron was quoted at 220 to 240 fr. per ton blooms were worth 320 fr. per ton, the present price of blooms should not be less than 640 to 650 fr. Small lots of blooms have been offered in the North at 650 to 670 fr. and small lots of billets at 700 to 720 fr. per ton.

**Finished Material.**—For prompt delivery prices are comparatively strong, consumers buying only to cover their most urgent needs. Prices quoted in the East and Lorraine are:

	Fr. per Metric Ton
Beams	750 to 780
Bars	780 to 820
Wire rods	850 to 880
Hoops	950 to 1,000

Prices quoted in the North:

	Fr. per Metric Ton
Beams	770 to 800
Bars	790 to 800

**Plates and Sheets.**—Prices vary not only according to districts, but among works in the same district. In the East and Lorraine, heavy sheets range from 800 fr. to 930 fr.; medium sheets, from 880 fr. to 1,100 fr.; and light sheets from 1,150 to 1,250 fr. Heavy sheets are easily obtainable, but medium and light sheets are scarce and in great demand. Flats are quoted at 820 to 900 fr. per ton.

#### French Exports Increase in February

According to French Customs' returns, France imported in February 62,721 metric tons of iron and steel products (raw, semi-finished and finished), compared with 55,960 metric tons in January. Exports totaled 236,716 metric tons in February, compared with 159,100 metric tons in January.

Welding is to be discussed by the Connecticut section of the American Society of Mechanical Engineers at the City Club, Hartford, May 14, by representatives of the Metal & Thermit Corporation and the Lincoln Electric Co.

J. C. Wicks & Co., Hanna Building, Cleveland, have been appointed sales agents for Ohio for the plate mill products of the Central Iron & Steel Co., Harrisburg, Pa.

M. J. Margulies has opened an office at 312 Liberty Building, Philadelphia, where he will do a general business in iron and steel.

## RUHR SETTLEMENT FORESEEN

### Prospect of Early Negotiation and Weak French Market Affect Belgian Buying

BRUSSELS, BELGIUM, April 25.—Influenced by the belief that negotiations on the Ruhr situation will shortly be opened and affected by the weakness in the French market, the Belgian iron and steel market is weak and tending downward. However, as Belgian consumers refrain from entering into new contracts pending a stabilization of prices, present quotations may be considered as mostly nominal. Export business is extremely restricted. Order-books of most producers are low.

Since April 1, Belgian blast furnaces have received 6000 tons of Ruhr coke, or 10 per cent of the amount seized. Consumers in the Grand Duchy of Luxembourg, who only receive coke from the Aix-la-Chapelle coalfield, complain of an insufficient supply. Belgian coke-ovens are operating at 80 per cent of normal capacity.

**Pig-iron.**—Blowing in blast furnaces in Lorraine has added to the weakness in pig-iron, and available tonnages of British iron are offered in Belgium without success. Chill-cast foundry pig-iron No. 3 P.L. is quoted 525 to 550 fr. per ton (from Luxemburg at 550 fr.) and basic pig-iron at 415 to 425 fr.

**Semi-finished Steel.**—The absence of important demand renders quotations on semi-finished steel uncertain, but prices are undoubtedly declining. Approximate prices for basic steel are as follows:

	Fr. Per Metric Ton
Ingots	530
Blooms	580
Billets	665
Sheet billets	710

**Steel Products.**—Orders are scarce and prices weak. The following prices are being quoted:

	Fr. Per Metric Ton
Merchant bars	700
Rolls	600 to 700
Large beams	675 to 700
Small beams	725 to 755
Rods	875
Angles	700
Hoops	950
Wire	900

**Sheets.**—Prices are as follows on sheets of basic quality:

	Fr. Per Metric Ton
Sheets:	
3 to 5 mm.	*725 to 800
2 mm.	875
1 mm.	1,100
0.5 mm.	1,250

\*Open-hearth quality 750 to 850 fr.

**Scrap.**—Scrap continues to decline and is selling with much difficulty.

Belgium produced in the first quarter of the year the following quantities of pig-iron and steel:

	Production	
	Pig Iron Tons	Steel (exclusive of castings) Tons
1923		
January	165,210	173,140
February	151,340	152,230
March	169,920	177,930

In 1913 Belgium produced an average of 207,058 tons of pig-iron per month and 200,398 tons of steel.

A total of 950,400 tons of metallurgical coke was produced in the first quarter. In meeting the conditions imposed by the Ruhr occupation, Belgium was nearly self-supporting in coke, although it was necessary to replace German coking slacks with much more expensive British slacks.

Luxemburg now has 21 furnaces in blast, compared with 31 on Jan. 1; while the number of Belgian blast furnaces in operation has, on the contrary, risen from 34 on Jan. 1 to 38 on April 1.

# Iron and Steel Markets

## MORE RAIL BUYING

### Orders Closed and Pending Put at 250,000 Tons

#### Steel Output at New High Point, While Premium Prices Are Disappearing

The volume of new buying of iron and steel is still in sharp contrast with the volume of consumption as well as of production. Some mills are booking orders equal to 50 per cent of current shipments, but they are exceptions, the average being considerably less.

There is a further gain in ability to make fairly early deliveries, so that in large part premium prices have disappeared. Independent steel companies that a short time ago were out of the market are now taking third quarter business, the trend of prices being toward those named by the Steel Corporation. Buyers, with few exceptions, have relaxed in no degree their demands for shipments on contracts.

Output of both pig iron and steel is well maintained, and in some districts has made an unexpected gain, the loss of labor to out-of-door operations being less thus far than was predicted.

Reports from 30 companies indicate a total steel ingot output of 3,947,800 tons in April, another high record. The recent increase in steel production is even more marked than that in pig iron, and it is estimated the present rate is close to 48,000,000 tons a year. The Steel Corporation is running at about 97 per cent of capacity.

The new rail buying movement that started last week is the chief market feature, and it is estimated that about 250,000 tons are represented in orders just taken or about to be closed. The New York Central, which is expected to take upward of 100,000 tons, has not advertised as yet, and the Pennsylvania is reported to be figuring on 30,000 to 40,000 tons.

Deliveries of the \$40 rails, of which nearly 1,500,000 tons were bought just before Oct. 1 last, were limited to the first half of this year. The sales just made and pending are at \$43, and for delivery in the second half. As many of these rails may not be laid until 1924, some of the present buying is to get the benefit of the \$43 price, which is out of relation to the market for other forms of steel. Leading Chicago mills have practically all the rails they can roll this year.

Railroad equipment buying has fallen off greatly from the recent pace, the week's orders amounting to 70 locomotives and 54 cars. However, the roads are ordering considerable steel, chiefly plates, for the repair of bad order cars. The Pennsylvania Railroad has placed 10,000 tons of car plates for May-June shipment. It is also seeking plates for third quarter.

Structural steel awards of the week were only about 13,000 tons, with 8000 tons additional pending. The uncertainties of labor costs in building,

which more and more amount to the certainty of increases, are reducing the estimates of structural steel requirements for the year.

The situation in sheets is easier. Automobile companies are not pushing for deliveries to the extent that was common six weeks ago and in some cases have held up shipments. Detroit has made a few suspensions also in other steel products.

In the pig iron market, interest centers in speculation as to when buying for third quarter will start and at what prices. The outlook is for a considerable buying demand for that delivery, but at somewhat lower prices, as is indicated by continued softening of the coke market and increasing production of pig iron. Two furnaces have been blown in in the Buffalo district and one in Detroit and several are scheduled to resume at an early date. In the extremely quiet market of recent weeks, prices have not been tested, but further softness has developed this week in some centers.

Steel scrap is extremely weak, with further reductions of 50c. to \$2 a ton. In the East large consumers are now offering only \$20 for melting steel, or \$7 below the high point reached earlier in the year.

By a conservative estimate, the decision of the United States Supreme Court sustaining the Minnesota occupation tax on iron ore means the payment of about \$2,000,000 for 1921, \$2,600,000 for 1922 and \$4,000,000 for the present year. Higher wages and other increases in costs, not including this tax, nearly offset the higher price for ore announced for this year.

THE IRON AGE finished steel composite price has dropped to 2.789c. per lb., from 2.810c. last week. This compares with 2.098c. last year and 2.764c. two years ago.

Pig iron remains unchanged at \$30.79, THE IRON AGE composite price having registered that price for four weeks. This compares with \$23.46 last year and \$22.80 two years ago.

## Pittsburgh

### Buying Less Active—Specifying Heavy—Production Maintained

PITTSBURGH, May 8.—New demands for steel have further declined since a week ago, but with the mills well supplied with specifications and getting few suspensions and no cancellations, the dullness is not causing much uneasiness nor has any weakness developed in prices. The week has seen the virtual disappearance of premium prices for early deliveries, but basis prices are undisturbed. Those who for some time have felt that the market was advancing rather too rapidly profess to be gratified by the dullness which has checked this tendency which, it is argued, will permit the mills to catch up with their obligations and result in a healthier situation.

Production is holding up in much better fashion than was expected, since, ordinarily, there is a considerable loss of labor with the advent of open weather.



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 8, 1923	May 1, 1923	Apr. 10, 1923	May 9, 1922
No. 2X, Philadelphia...	\$32.76	\$32.76	\$33.14	\$26.26
No. 2X, Valley furnace...	31.00	31.00	31.00	24.00
No. 2X, Southern, Cin'ti...	31.05	31.05	31.05	22.00
No. 2X, Birmingham, Ala...	27.00	27.00	27.00	17.50
No. 2X, foundry, Chicago...	32.00	32.00	32.00	22.00
Basic, del'd, eastern Pa...	30.25	30.25	30.25	23.50
Basic, Valley furnace...	31.00	31.00	31.00	25.00
Valley Bessemer, del. P'gh	32.77	32.77	32.77	26.96
Malleable, Chicago...	32.00	32.00	32.00	22.00
Malleable, Valley...	31.00	31.00	31.00	24.50
Gray forge, Pittsburgh...	32.27	32.27	32.27	25.46
L. S. charcoal, Chicago...	36.65	36.65	36.65	28.00
Ferromanganese, furnace...	130.00	125.00	125.00	65.00

### Rails, Billets, Etc., Per Gross Ton:

	May 8, 1923	May 1, 1923	Apr. 10, 1923	May 9, 1922
O-h. rails, heavy, at mill...	\$43.00	\$43.00	\$43.00	\$40.00
Bess. billets, Pittsburgh...	45.00	45.00	45.00	33.00
O-h. billets, Pittsburgh...	45.00	45.00	45.00	33.00
O-h. sheet bars, P'gh...	45.00	45.00	47.50	35.00
Forging billets, base, P'gh	55.00	55.00	52.00	37.00
O-h. billets, Phila...	50.17	50.17	50.17	37.24
Wire rods, Pittsburgh...	51.00	51.00	50.00	38.00
Skelp, gr. steel, P'gh, lb...	2.50	2.50	2.35	1.50
Light rails at mill...	2.25	2.25	2.25	1.50

### Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.825	2.825	2.825	1.96
Iron bars, Chicago...	2.60	2.60	2.60	1.65
Steel bars, Pittsburgh...	2.40	2.40	2.50	1.60
Steel bars, Chicago...	2.69	2.84	2.84	1.65
Steel bars, New York...	2.74	2.74	2.84	1.88
Tank plates, Pittsburgh...	2.50	2.50	2.50	1.50
Tank plates, Chicago...	2.84	2.84	2.84	1.65
Tank plates, New York...	2.84	2.84	2.84	1.88
Beams, Pittsburgh...	2.50	2.50	2.50	1.50
Beams, Chicago...	2.84	2.84	2.84	1.65
Beams, New York...	2.84	2.84	2.84	1.88
Steel hoops, Pittsburgh...	3.30	3.30	3.30	2.00

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	May 8, 1923	May 1, 1923	Apr. 10, 1923	May 9, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.85	4.00	4.00	3.15
Sheets, galv., No. 28, P'gh.	5.25	5.25	5.25	4.15
Sheets, blue an'd, 9 & 10	3.25	3.25	3.25	2.40
Wire nails, Pittsburgh...	3.00	3.00	2.90	2.40
Plain wire, Pittsburgh...	2.75	2.75	2.65	2.25
Barbed wire, galv., P'gh...	3.80	3.80	3.70	3.05
Tin plate, 100-lb. box, P'gh.	\$6.00	\$6.00	\$6.00	\$4.75

### Old Material, Per Gross Ton:

Carwheels, Chicago...	\$26.00	\$26.00	\$28.50	\$18.50
Carwheels, Philadelphia...	25.00	25.00	27.00	16.50
Heavy steel scrap, P'gh...	23.50	24.50	26.00	17.50
Heavy steel scrap, Phila...	20.00	22.00	24.00	14.50
Heavy steel scrap, Ch'go...	20.00	21.50	23.00	15.25
No. 1 cast, Pittsburgh...	27.00	27.00	28.00	18.50
No. 1 cast, Philadelphia...	25.00	25.00	27.00	18.50
No. 1 cast, Ch'go (net ton)	\$4.00	25.00	26.50	16.25
No. 1 RR. wrot, Phila...	25.00	25.00	28.00	17.00
No. 1 RR. wrot. Ch'go (net)	18.50	19.50	20.50	13.00

### Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt...	\$5.00	\$6.00	\$6.25	\$6.00
Foundry coke, prompt...	6.00	7.00	7.75	6.00

### Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	16.75	16.62½	17.37½	13.00
Electrolytic copper, refinery	16.25	16.37½	17.00	12.75
Zinc, St. Louis...	7.07½	6.80	7.45	5.00
Zinc, New York...	7.42½	7.15	7.80	5.35
Lead, St. Louis...	7.20	7.60	8.15	5.15
Lead, New York...	7.50	7.75	8.40	5.35
Tin (Straits), New York...	43.62½	45.25	46.50	30.62½
Antimony (Asiatic), N. Y.	7.62½	7.75	8.50	5.37½

### Composite Price, May 8, 1923, Finished Steel, 2.789c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	May 1, 1923, 2.810c. April 10, 1923, 2.810c. May 9, 1922, 2.098c. 10-year pre-war average, 1.689c.
These products constitute 88 per cent of the United States output of finished steel	

### Composite Price, May 8, 1923, Pig Iron, \$30.79 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	May 1, 1923, \$30.79 April 10, 1923, 30.86 May 9, 1922, 23.46 10-year pre-war average, 15.72
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This, coupled with the definite opposition of leaders of the industry to unrestrained advances, has been reassuring to buyers and the tendency to buy far in advance of requirements is no longer apparent. Although the Steel Corporation's subsidiaries are well committed through the third quarter, there is still considerable open capacity for that period among the independents.

There is evidence that other automobile builders beside the Ford Motor Co. have secured rather generous supplies of steel and if they are not holding up shipments, they are specifying with less freedom than was the case recently.

Weakness in crude oil, which forecasts some modification of drilling programs, has begun to be felt in the demand for oil country tubular goods. The supply situation in wire goods is not so tight as it was a short time ago, in that some large producers who hitherto have been turning down more business than they have been entering are now accepting third quarter business. While the Steel Corporation prices on sheets and tin plate generally were regarded by independent manufacturers as too low, they will be the basis of some independent production, and because full

galvanizing department operations are impossible on account of shortage of labor, some already find themselves with an over-supply of black sheets for which they are glad to find an outlet at the Steel Corporation base, 3.85c. The market is not materially easier on semi-finished steel, but with the demand less active and pig iron and scrap prices tending lower, indications are that sales of semi-finished material in the near future will be at more moderate prices than have hitherto prevailed.

Just where the market is on pig iron is hard to determine because there is such a complete absence of activity. Producers still are quoting \$31, furnace, for the leading grades, but it is openly admitted that no business is possible at that figure and that the next important transaction will be at a lower figure.

There has been a further decline from 50c. to \$1 a ton in scrap prices since a week ago, and the spot coke market is down 50c. to \$1 a ton from last week's levels.

**Pig Iron**—Still another week has gone by with no awakening of interest in supplies on the part of melters and this indifference is beginning to tell on the price

ideas of producers. There has been no change in quotations, but there is so little activity that they have become nominal and furnace interests are merely waiting for buyers to take the first step toward opening negotiations that will mean the establishment of a trading basis. Consumers, however, are waiting on the producers to take the lead in the hope that the desire for business may be strong enough to result in lower prices than otherwise might be established. There was one sale during the week of 1000 tons of basic iron at \$28, Valley Furnace basis, but the iron is coming from a furnace being operated under the direction of a creditors' committee, and the need of funds was so urgent as to force acceptance at that price. In the circumstances, the sale is hardly representative and is not recognized in our quotations. A reduction in prices probably could be safely made, but the question arises as to what the new quotations should be in the absence of sales upon which to base them.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.77 per gross ton:

Basic .....	\$31.00
Bessemer .....	31.00
Gray forge .....	30.50
No. 2 foundry .....	31.00
No. 3 foundry .....	30.50
Malleable .....	31.00
Low phosphorus, copper free .....	36.00

**Ferroalloys.**—We note no special change in the situation locally, as regards either the demand or prices. Consumers generally are well covered by contracts and thus far there has been no falling down on deliveries by producers. The outlook is for moderate supplies of ferromanganese for the next few months, but the suggestion that prices are going to advance sharply from current levels finds few subscribers, because there is capacity for increased domestic production and it is probable that consumption during the next few months will be lighter than in the past three months due to curtailed steel works operations incident to warm weather.

**Plates.**—Urgent demands have pretty well subsided as a result of the increased willingness of mills quoting the lower prices to take business for reasonably early delivery and it may now be said that as a sales basis 2.75c has disappeared. We quote the market at 2.50c to 2.60c, Pittsburgh, the higher figure being that of mills which would have to absorb freight in shipping in this direction. The Pressed Steel Car Co. is understood to have closed for about half of its recent inquiry and has deferred the purchase of the remainder of the tonnage, amounting in all to 17,000 tons. Mills are well obligated over the next three months, but most of them can take third quarter business. Weakness in the crude oil market, due to excessive production, is expected to bring out more storage tank business. Prices are given on page 1374.

**Steel Rails.**—Light rails are easy to obtain and efforts to advance the price meet with no success since demands are anything but numerous and usually are for small lots. The explanation is found chiefly in the dull and weak market for coal, mine operators being the heaviest buyers of light sections.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2.25c. base; standard rails, \$43 per gross ton mill for Bessemer and open-hearth sections.

**Semi-Finished Steel.**—There has been no perceptible weakening in the market locally. Independent sheet manufacturers who make their own steel are operating their own finishing mills so fully that they have practically no steel to spare over and above their own requirements and those of their regular customers. It is hard for those who must have tonnages for early delivery to secure them at less than \$45 and more recently was paid on fair-sized tonnage for shipment west. Those who have billets to sell for early delivery have no trouble in getting \$45 for the base size and as much as \$46.50 still is asked for small billets. Offerings of forging billets and skelp still are very limited and the fact that wire rods still can be sold at \$55 for the base sizes indicates no weakening in the situation in that product. Buyers cannot well pay current prices for semifinished steel and hope for very large profits at today's going prices on finished prod-

ucts. This may well have an effect upon the demand and in view of the steady decline in scrap prices and the fact that some producers may have surplus supplies when finishing mill operations reflect the loss of men incident to warm weather, it would seem as though the next change in prices would be down. Prices are given on page 1375.

**Structural Material.**—Conditions show no special change other than that it is no longer hard to interest the mills in fresh tonnages for reasonably early delivery at the regular market quotations. Mills have good-sized orders on their books, but unless there is more new business in the near future, they are likely to be seeking tonnages for late third quarter delivery. Much of the fabricated business now coming out is for small tonnages and the shops seem able to meet such demands without calling on the mills. It is said that architects are advising investors to defer new construction, not so much on account of the cost of steel as the high labor rates in the building trades. We quote plain material at 2.50c to 2.60c, Pittsburgh, but on the right sort of jobs the higher figure is the exception. Prices are given on page 1374.

**Wire Products.**—The American Steel & Wire Co. has made a revision in its gage extras on some sizes of plain and galvanized wire. Extra for No. 15 gage plain wire has been increased from 45c. to 55c. per 100 lb.; No. 16 gage from 60c. to 75c. and No. 17 gage from 75c. to \$1; extra on No. 13 gage galvanized has been advanced from 65c. to 70c. and on No. 14 gage from 75c. to 80c. These changes have been adopted by independent makers. The situation in wire products generally shows little change, except that some makers now are taking third quarter business at today's prices. Pressure for shipments against orders still is heavy, save in the case of woven fence, a seasonal product, which must be in dealers' hands when the farmers want it and they now are beyond the season for fence building. Labor shortages hamper deliveries, but are not preventing some reduction in mill obligations. Prices are given on page 1374.

**Sheets.**—Some of the independent mills following a policy of selling ahead are observing the Steel Corporation prices recently announced, but the movement is by no means general and for early deliveries, prices, as a rule, are not lower than they have been. Some makers, on account of inability to secure sufficient help in their galvanizing departments, have excess supplies of black sheets and are taking business for early delivery at the Steel Corporation price of 3.85c. base. Few mills in this and nearby districts want any more galvanized sheet orders for the present and the market on blue annealed sheets is showing remarkable strength, it still being hard to secure tonnages for prompt shipment much below 3.25c. base. Independent mills maintain a very high rate of operation and at present are doing very much better in this respect than the leading interest, which is feeling the scarcity of labor. The latter now appears to be well sold up against third quarter production as a result of allotments to regular customers for that period. Prices are given on page 1374.

**Iron and Steel Bars.**—There no longer is justification for a price higher than 2.50c., base, Pittsburgh, for steel bars in this district, even for early delivery. One fairly large producer here, who has been quoting 2.75c., base, now is seeking business and naming 2.50c. Practically all other producers are taking third quarter business at 2.40c., base, and are not seeking more for such tonnages as they can take for earlier shipment. There is no letup in the pressure for shipments on contracts, but strictly new business is of moderate proportions. Makers of iron bars are holding at former prices.

We quote soft steel bars, rolled from billets at 2.40c. to 2.50c., base, bars for cold-finishing of screw stock analysis, \$3 per ton over base; reinforcing bars, rolled from billets, 2.40c. to 2.50c., base; refined iron bars, 3.25c. base, in carload lots or more f.o.b. Pittsburgh.

**Tubular Goods.**—Sinclair Oil Co. has closed with a Valley mill for 72 miles of 4-in., 6-in., and 8-in. pipe for a line in Nebraska. Large oil companies cannot very well abandon production schedules or drilling cam-



paigms, but the recent decline in crude oil prices has caused the smaller producing units to modify their plans. This is one explanation for a less insistent demand for oil country goods. Generally, buyers are more moderate in their demands, although they are not relaxing in their efforts to secure shipments against orders already on mill books. Steel pipe makers are running well as far as production of pipe is concerned, but are hampered in their finishing departments by a shortage of labor. Labor shortages also are a hindrance to normal functioning of wrought iron pipe mills. Buying of boiler tubes at the prices established April 19, is cautious. Discounts are given on page 1374.

**Tin Plate.**—It may be stated that while the Steel Corporation price of \$5.50 per base box, Pittsburgh, for third quarter business, is not generally acceptable to independent manufacturers, they will observe that price on shipments to makers of packers' cans and probably to preferred trade among manufacturers of other kinds of tin plate products. On the remainder of their production, the effort will be to secure \$5.75 to \$6 for third quarter orders. No supplies of production plate are available for prompt delivery under \$6 and some makers are asking up to \$6.25. The market for quick delivery tonnages is a rather slim one and the third quarter market is at hand, since specifications for July deliveries must be in by May 15, or soon afterward.

**Cold-Finished Steel Bars.**—New business is lighter than it has been, but specifications against contracts and orders are sufficient to absorb production, and the market may still be correctly described as firm. Some suspensions are coming from the automotive industry, but the tonnage thus released is being applied to orders from consumers. The bulk of the business still is in the smaller sizes in the screw stock classification, shafting demands being relatively light. There has been no change in ground shafting prices.

**Hot-Rolled Flats.**—This line of products is still quotable at from 3.30c. to 3.50c., base, Pittsburgh, although the more common quotation on hot-rolled strips now is 3.50c., base. Some makers of the latter, however, did not fill up as fully as they might have and have tonnage which cannot readily be sold above the minimum price. Makers of cotton ties have generally closed their books after taking specifications for requirements for a cotton crop of about 10,000,000 bales. The price is \$1.60 per bundle of 45 lb. for delivery between now and July 1, after which there is a carrying charge of 1c. per bundle per month. Prices are given on page 1374.

**Cold-Rolled Strips.**—While a number of makers are so well committed as to be unwilling to consider more business at less than \$5.50, base, Pittsburgh, there are just as many who still can take orders and are accepting them at 25c. less.

**Bolts, Nuts and Rivets.**—New business in these products has decreased, but the specifications against contracts are holding up fairly well. Prices show no change. They are given on page 1374.

**Track Fastenings.**—There is a steady demand for small lots of these products and with buyers specifying well against contracts, makers still are busy. Prices are unchanged. They will be found on page 1374.

**Steel Chain.**—Effective May 3, leading makers advanced prices of pound chain \$5 per ton to a base of \$6.50 per 100 lb., Pittsburgh, for 1-in. proof coil chain. The new price represents an advance, in slightly more than a year, of \$20 per ton, and about matches the increase in the same period in the prices of rods and bars. The price of steel loading chain has been advanced 50c. per 100 lb.

**Coke and Coal.**—Coke prices for spot tonnages still are yielding because in the face of a curtailment in production by beehive oven operators, the supply still exceeds the demand. Furnace grade this week is quotable from \$5 to \$5.75 per net ton at oven as against \$5.50 to \$6.50 a week ago, while foundry coke this week is priced anywhere from \$6 to \$7, or 50c. per ton below the range of a week ago. Work being steadier in the Connellsville field than in others, a

good many miners are drifting into that district, which also is being favored with a full car supply. Meanwhile, there is a full production of by-product coke on account of the low priced coal, and, lacking an export outlet, Connellsville producers find it very hard to find a place to put their surplus production. On third quarter contracts for furnace coke, some large operators are naming \$7, but others are quoting as low as \$6, the latter figure being more in line with present ideas of blast furnace interests. A few contracts have been made at \$6.25 to \$6.50, but the tonnage involved is unimportant. The coal market remains very dull and prices still favor buyers. The spot market on mine run steam coal is still quotable at \$1.75 to \$2 per net ton at mines for Fairmont coal, and from \$2 to \$2.25 for Pittsburgh seam coal, and from \$2.50 to \$2.75 for gas and coking coal. Operators are quoting \$3 for lump steam coal for lake shipment on contracts, but this is much above what buyers are willing to pay and there is little business. We note a few sales of lump steam coal for lake shipment at prices ranging from \$2.25 to \$2.65.

**Old Material.**—Prices continue to give ground under a very slow demand and increased anxiety on the part of dealers to make sales. One local steel company, which has been a fairly persistent buyer for the past few weeks lately secured heavy melting steel at \$24. That is now the positive maximum on this grade and dealers are unable to obtain even that price. They are not offering more than \$23 and appear willing to talk business with mills at \$23.50. The prices paid on the recent railroad offerings, though somewhat below those of the previous month, were high compared with current market prices. The Pennsylvania Railroad obtained about \$28 per gross ton delivered for specialties, above \$25 for heavy melting grade and above \$22 for rails. These purchases are applied against short sales at the peak prices and still leave purchasers a good profit. Heavy melting steel being shipped in runs so poor that some mills prefer compressed sheet scrap at a price with 50c a ton of the former. We revise prices down on practically all grades and consider the market weak.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

*Per Gross Ton*

Heavy melting steel.....	\$23.50 to \$24.00
No. 1 cast, cupola size.....	\$27.00 to 27.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va.; and Franklin, Pa. ....	25.00 to 25.50
Compressed sheet steel.....	23.00 to 23.50
Bundled sheet sides and ends...	21.00 to 21.50
Railroad knuckles and couplers...	26.00 to 26.50
Railroad coil and leaf springs...	26.00 to 26.50
Low phosphorus standard bloom and billet ends .....	29.00 to 30.00
Low phosphorus, plates and other grades .....	26.50 to 27.00
Railroad malleable .....	25.00 to 25.50
Steel car axles .....	27.00 to 27.50
Cast iron wheels .....	25.00 to 26.00
Rolled steel wheels .....	26.00 to 26.50
Machine shop turnings .....	19.50 to 20.00
Heavy steel axle turnings.....	22.00 to 22.50
Short shoveling turnings.....	19.50 to 20.00
Cast iron borings.....	20.50 to 21.00
Heavy breakable cast.....	23.50 to 24.00
Stove plate .....	19.50 to 20.00
Sheet bar crop ends .....	28.00 to 29.00
No. 1 railroad wrought.....	19.00 to 19.50

### Southern Stocks Reduced—Tennessee Company Mill Starts

BIRMINGHAM, ALA., May 8.—Merchant iron stocks on furnace yards were reduced by 6000 tons in April. Stocks on hand April 1 and May 1 were as follows: Foundry, 28,000 and 22,000 tons; machine cast, 1700 and 3800 tons; warrants, 600 tons, no change; basic, 9600 and 12,000 tons; total, 40,000 and 39,000 tons. One maker has 12,000 tons of merchant iron on hand, the rest is scattered.

The Tennessee company started its merchant bar mill today and will roll 6000 to 7000 tons a month for the time being. The usual concession under Pittsburgh prices plus freight will be granted Southern purchasers.

## Chicago

### Premiums Disappear—Recent Purchases of Rails Make Large Total

CHICAGO, May 8.—Quiet prevails in practically all commodities and prices are firm although there has been a noticeable disappearance of so-called premiums. Caution, fostered by the belief that prices have reached their peak, actuates the policy of most buyers and only the railroads and the automobile manufacturers remain conspicuous factors in the market. While the carriers have largely ceased buying new rolling stock, they are inquiring for considerable quantities of early delivery steel for car repair work. Available delivery on new equipment is remote; hence present efforts are being concentrated on rehabilitating as large a number of bad order cars as possible before heavy fall traffic sets in.

The carriers are also manifesting interest in additional rails with the hope, no doubt, of placing tonnage for 1924 laying at present price, which is considered low in comparison with other steel commodities.

It is estimated that recent purchases of rails aggregate 250,000 tons, of which fully 60 per cent went to Eastern mills. While it is possible that some of this tonnage may be rolled before the close of the year, it is probable that it will be delivered too late for laying before 1924. The attitude of the mills toward pending rail business is not clearly defined. In Chicago, at any rate, producers appear to have all the rails they can roll this year and are not yet ready to open their books for next year.

Steel works operations show little change. Illinois Steel Co. has lighted its eleventh stack at South Works while Wisconsin Steel Works yesterday blew in its third blast furnace. The latter, however, will be used for the production of foundry iron for the plants of the International Harvester Co.

**Pig Iron.**—There is little activity in the market, except the occasional placing of orders for prompt shipment. Nothing resembling a third quarter buying movement has started, although now and then a purchase for that delivery is reported. A Michigan automotive melter, for example, has just closed for 500 tons of Northern foundry for third quarter. Pig iron consumption shows no diminution and in view of the fact that melters' stocks are not large, it is felt that it is only a question of time when buying will be resumed on a broad scale. Prices are generally firm and unchanged. Northern iron, however, can now be bought for prompt shipment at \$32 base furnace or on the same basis as iron for forward delivery. Two lots of 200 tons each of Southern foundry for prompt shipment as well as a number of spot cars have been sold at \$27 base, Birmingham, indicating no change in the Southern market. In the absence of transactions, the appended quotations on low phosphorus must be regarded as nominal.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil.	
1.50, delivered at Chicago.....	\$36.65
Northern coke, No. 1, sil. 2.25 to 2.75....	33.00
Northern coke, foundry No. 2, sil. 1.75 to 2.25 .....	32.00
Malleable, not over 2.25 sil.....	32.00
Basic .....	32.00
High phosphorus .....	32.00
Southern No. 2.....	33.01
Low phos., sil. 1 to 2 per cent, copper free (nominal) .....	\$36.00 to 37.00
Silvery, sil. 8 per cent.....	44.29

**Rails and Track Supplies.**—A number of railroads have indicated their desire to place rails for 1924 delivery at present prices. Local mills, however, have not opened their books for next year and have not yet announced their prices for that delivery. The Chicago & Eastern Illinois is inquiring for 10,000 tons and another Western road is in the market for 25,000 tons for 1924. While some tonnage was recently booked for delivery late this year, mills apparently are unwilling to promise shipments against new business before Jan. 1. An inquiry for 5000 tons of tie plates is in the market and there has been an active demand for angle

bars and for spikes and bolts in lots of from 500 to 10,000 kegs. A considerable portion of this business was for coast delivery and was lost to mills having a freight advantage over local producers. Light rails are quiet, although April sales were the heaviest in six months.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.80c. base and track bolts, 4.80c. base.

**Ferroalloys.**—Sales of foreign spiegeleisen, one of them involving several carloads, have been made at \$57.50 to \$58.50 delivered. A carload of ferromanganese for third quarter has been sold at \$125 seaboard. Quotations for prompt delivery range from \$127.50 to \$130 seaboard, but buyers prefer to wait for July shipment to get the benefit of the second half quotation.

We quote 80 per cent ferromanganese, \$132.56 for second half delivery and \$135.06 to \$137.56 for prompt shipment; 50 per cent ferrosilicon, \$95, delivered; spiegeleisen, 18 to 22 per cent, \$57.50 to \$58.50 delivered.

**Plates.**—Railroad car buying and oil storage tank construction, two of the largest sources of plate business, have fallen off markedly. The decline in crude oil prices has discouraged further development of the oil fields. Car purchases have dropped off because of the remote deliveries now available from builders. On the other hand, the railroads are concentrating their efforts on the repair of cars in preparation for fall traffic and this is bringing out considerable demand for plates, shapes and bars for early delivery. Generally speaking, however, plate buying is on a reduced scale and while the prices of local producers for material for indefinite shipment remain unchanged, steel for specific delivery can be obtained on better terms than heretofore. While some mills east of here are holding for 2.60c. base, Pittsburgh, a substantial tonnage of plates for May delivery was recently placed at 2.50c. base, Pittsburgh.

The mill quotation is 2.60c., Chicago, for indefinite delivery and 2.84c. to 2.94c. delivered Chicago for specific shipment. Jobbers quote 3.30c. for plates out of stock.

**Structural Material.**—Building permits issued in Chicago in April involved a total cost of nearly \$61,000,000, as against \$30,000,000 for March and only \$17,000,000 in April, 1922. Although fabricating awards for the week show a sharp falling off from the total tonnage let during the previous week, there is still much work pending and immediate let-up in building activity is not in sight. In certain instances labor and material costs have caused the postponement or redesign of work, but the situation as a whole has not yet been materially affected. Buying of plain material is increasingly cautious, indicating that the trade feels that the market has reached its peak. In fact, material for specific delivery is more readily available from sources east of here at 2.50c. to 2.60c., Pittsburgh, while local prices for indefinite shipment remain unchanged.

The mill quotation on plain material is 2.60c., Chicago, for indefinite delivery. We quote 2.84c. to 2.94c. delivered Chicago for plain material for specific shipment. Jobbers quote 3.30c. for plain material out of warehouse.

**Bars.**—In a market in which caution is the byword of purchasing agents, there is nevertheless the readiness to buy when deliveries are satisfactory and prices are not regarded too high. Several good-sized lots of soft steel bars for May shipment have been bought by Chicago district users at 2.45c. and 2.50c. base, Pittsburgh. From at least one source east of here material is available for six to eight weeks' delivery at from 2.35c. to 2.40c. base, Pittsburgh. The prices of local producers on material for indefinite shipment remain unchanged. Prominent among buyers are the implement makers, the automobile manufacturers and the railroads.

Mill prices are: Mild steel bars, 2.50c., Chicago, for indefinite delivery and 2.69c. to 2.84c. delivered Chicago, for specific shipments; common bar iron, 2.60c., Chicago; rail steel, 2.30c. to 2.40c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.50c. for rounds and 5.05c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3.15c. base; hoops, 4.55c.; bands, 3.95c.



**Warehouse Prices.**—Local jobbers have advanced cold-finished steel bars and shafting and cold strip steel and flat wire \$5 a ton. The new prices on cold-rolled bars and shafting are published under the bar paragraph. Cold-rolled strip, hard, and 0.100 in. and heavier, is now quoted at 7.40c. base, while cold-rolled flat wire, one in. wide by 0.100 in. and thicker, has been raised to the same base price.

**Wire Products.**—The leading interest is booking business very cautiously, restricting its sales to its regular trade. Tonnage now on the books will overlap deep into third quarter and with costs steadily increasing, its present problem is to make deliveries rather than to increase its obligations. Its operations remain at 75 per cent, which is the best that can be done with existing labor supply. Demand for nails is pressing; in fact, in excess of supply. A recent inquiry for 15,000 kegs of nails from the packing industry remains unsatisfied. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1374.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, \$3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, \$3.95 per 100 lb.; cement coated nails, \$3.40 per keg.

**Cast Iron Pipe.**—The strength of prices is indicated by an award of 100 tons of 4, 6 and 8-in. by Oconomowoc, Wis., to James B. Clow & Sons at \$56.30 base, Birmingham. There is considerable variation in going prices according to the sizes and deliveries desired. The quotations carried below are conservative. The National Cast Iron Pipe Co. has taken 200 tons for Bettendorf, Iowa. Ely, Minn., has awarded 200 tons of 12-in. to the United States Cast Iron Pipe & Foundry Co. Saginaw, Mich., takes bids on 100 tons of 6-in. May 15. Inability to sell bonds covering 700 tons of pipe has caused Mt. Greenwood, Ill., to enter the market a third time.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., \$64.20; 6-in. to 12-in., \$60.20; above 12-in., \$58.20 to \$59.20; class A and gas pipe, \$5 extra.

**Bolts and Nuts.**—New business is light, while specifications are fair. Discounts remain unchanged at the March 1 level.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.10c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to  $\frac{3}{4}$  x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, \$2.50 off; blank nuts, \$2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

**Sheets.**—But for the heavy commitments already on mill books present demand would not be considered large. Considered in relation to bookings, however, it is beyond the capacity of some mills. It is notable, however, that mills' ideas as to prices have grown more conservative and sheets for fairly early delivery can be obtained from a number of independent sources at the quotations recently announced by the Steel Corporation subsidiary. Those prices are being used by the local independent in the allocation of its third quarter tonnage. This distribution is being limited to regular customers, but owing to a substantial carry-over of second quarter tonnage, the company finds itself able to take care of only about 60 per cent of their wants.

Mill quotations are 3.85c. to 4c. for No. 28 black, 3c. to 3.25c. for No. 10 blue annealed and 5c. to 5.25c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.35c. for blue annealed, 5.20c. for black and 6.35c. for galvanized.

**Reinforcing Bars.**—The heavy buying which took place on the eve of the recent advance is indicated by reports of additional awards, totaling about 4000 tons. Besides these lettings of 100 tons each or larger, many smaller lots were booked. While slow deliveries of steel from the mills are still causing concern, the surprising fact is the infrequency of delays to building construction caused thereby. Among the larger awards for the week the Federal Reserve Bank Building, St. Louis, involves 900 tons. The design of this structure was changed from fabricated steel to reinforced concrete.

Lettings include:

Addition to Misericordi Hospital, Milwaukee, 120 tons to Truscon Steel Co.

Wisconsin State Highway Work, 100 tons to Corrugated Bar Co.

Federal Reserve Bank Building, St. Louis, 800 tons to Laclede Steel Co., 100 tons spirals to Corrugated Bar Co.

St. Luke's Hospital, Duluth, Minn., 400 tons to Corrugated Bar Co.

Builders Lime & Cement Co. building, Davenport, Iowa, 400 tons to Concrete Steel Co.

Pineville, Ky., electric plant, 300 tons to Joseph T. Ryerson & Son.

St. Paul Gaslight Co. power plant, St. Paul, Minn., 250 tons to Kalman Steel Co.

Johnson Service building, Milwaukee, Wis., 225 tons to Corrugated Bar Co.

Two highway bridges for State Highway Commission, Glencoe, Ill., 200 tons to American System of Reinforcing.

Oklahoma highway work, 150 tons to Corrugated Bar Co.

Dorsen building, Milwaukee, Wis., 125 tons to Corrugated Bar Co.

Parochial school, Racine, Wis., 100 tons to Kalman Steel Co.

National Storage & Warehouse Co. warehouse, South Bend, Ind., 100 tons to Kalman Steel Co.

Missouri highway work, 100 tons to Corrugated Bar Co.

Minnehaha Lodge building, Minneapolis, Minn., 100 tons to Minneapolis Steel & Machinery Co.

Eclipse Realty building, St. Louis, Mo., 100 tons to Corrugated Bar Co.

Miles Standish School, Minneapolis, Minn., 103 tons to Cowin & Co., Minneapolis.

Minnehaha School, Minneapolis, Minn., 104 tons to Minneapolis Steel & Machinery Co.

James Fenimore Cooper School, Minneapolis, 114 tons to C. A. P. Turner Co.

Pending work includes:

St. Anthony's School, St. Louis, Mo., 150 tons.

Brokaw, Wis., dam, 125 tons.

Apartment building, Broadway and Buckingham Place, Chicago, 125 tons.

Frieberger Estate building, Fort Wayne, Ind., 100 tons.

**Old Material.**—Outside of a purchase of about 2000 tons of heavy melting by an independent mill, there has been no consumer buying of consequence. The available supply of scrap continues to be augmented by offerings from all the usual sources and prices have again declined. A considerable tonnage of unsorted material has recently been offered by the railroads, indicating a shortage of labor. Yard dealers likewise are short of help and prices of that class of scrap have therefore dropped accordingly. While there are few who will hazard a guess as to when and how much prices will recover, heavy pig iron production is regarded as an important obstacle to an early return to the high quotations of six weeks ago.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	\$25.00 to \$26.00
Cast iron car wheels	26.00 to 26.50
Relaying rails, 56 and 60 lb.	28.50 to 29.50
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	27.00 to 27.50
Rails for rolling	22.50 to 23.00
Steel rails, less than 3 ft.	24.00 to 24.50
Heavy melting steel	20.00 to 20.50
Frogs, switches and guards cut apart	20.00 to 20.50
Shoveling steel	19.75 to 20.25
Drop forge flashings	17.00 to 17.50
Hydraulic compressed sheets	18.50 to 19.00
Axle turnings	18.50 to 19.00

Per Net Ton	
Iron angle and splice bars	25.00 to 25.50
Steel angle bars	20.00 to 20.50
Iron arch bars and transoms	24.50 to 25.00
Iron car axles	30.00 to 30.50
Steel car axles	23.25 to 23.75
No. 1 busheling	17.50 to 18.00
No. 2 busheling	13.00 to 13.50
Cut forge	18.25 to 18.75
Pipes and flues	14.50 to 15.00
No. 1 railroad wrought	18.50 to 19.00
No. 2 railroad wrought	18.25 to 18.75
Steel knuckles and couplers	23.50 to 24.00
Coil springs	24.00 to 24.50
No. 1 machinery cast	24.00 to 24.50
No. 1 railroad cast	22.00 to 22.50
No. 1 agricultural cast	22.00 to 22.50
Low phos. punchings	20.00 to 20.50
Locomotive tires, smooth	20.50 to 21.00
Machine shop turnings	13.50 to 14.00
Cast borings	15.00 to 15.50
Short shoveling turnings	15.50 to 16.00
Stove plate	19.00 to 19.50
Grate bars	19.00 to 19.50
Brake shoes	19.00 to 19.50
Railroad malleable	23.50 to 24.00
Agricultural malleable	22.50 to 23.00

## New York

### Railroad Troubles in New England—Pig Iron Dull—Coke Prices Lower

NEW YORK, May 8.—The declaring of embargoes after a fashion which recalls those of winter months has made deliveries in New England more difficult. They are possible to few points without permits and many delays occur. This condition is attributed not to another breakdown of the railroads, but to the great rush of shipments causing congestion at important points. Embargoes extend to finished lines as well as to pig iron and coke.

**Pig Iron.**—Extreme dullness continues and total sales were smaller than for a number of weeks, while the only inquiry pending is one for 1000 tons of foundry grades for New England. A few sales have been made to New England foundrymen for as early shipment as possible, as these melters recognize the importance of entering orders now when the uncertainty of obtaining deliveries later is clearly indicated. At Buffalo one melter is understood to be quoting \$29, while the others are still holding for \$29.50. Other iron in western New York and also in eastern New York is obtainable at about \$28.50, furnace.

We quote delivered in the New York district as follows, having added to furnace prices \$2.27 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	\$35.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	34.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	33.27
Buffalo, sil. 1.75 to 2.25	33.41 to 33.91
No. 2X Virginia, sil. 2.25 to 2.75	34.94
No. 2 Virginia, sil. 1.75 to 2.25	34.44

**Ferroalloys.**—Demand for ferromanganese is confined to carload and small lots for which \$130, seaboard or furnace, has been paid for spot or early delivery. In some cases \$135 has been asked. On contract the alloy is still available for shipment in the last four months of the year at \$125, seaboard. Imports in January were only 4218 tons, much less than has been generally believed. The leading domestic producer of spiegeleisen is still out of the market, but there have been sales of carload and small lots for prompt and early delivery around \$50 to \$55, basis furnace. Demand is not especially active, but the situation is very tight. Both Brazilian and Indian manganese are reported as very scarce, with quotations nominal. The minimum price on 50 per cent ferrosilicon is \$95, delivered, with demand confined to carload and small lots, but with specifications on contract heavy. One producer of electrolytic 14 to 16 per cent ferrosilicon is out of the market for at least four months.

**Cast-Iron Pipe.**—Makers are well filled with orders for several months and prices are firm. Considerable difficulty is encountered by makers in this district on shipments of pipe to New England points, because of the numerous railroad embargoes. A recent municipal award was that of the city of Claremont, N. H., which placed 500 tons of 10-in. and 12-in. water pipe with the Warren Foundry & Pipe Co. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$58.50; 4-in. and 5-in., \$63; 3-in., \$68.80, with \$4 additional for Class A and gas pipe. The soil pipe market is quiet as jobbers await deliveries on old orders. Prices are firm with no expectation of immediate revision. We quote discounts of both Southern and Northern makers, delivered New York, as follows: 2 to 6-in. standard, 13 to 15% per cent off list; heavy, 23 to 25% per cent off list.

**Warehouse Business.**—There is a continued heavy demand for a wide range of materials carried in stock, particularly plates and structural material. Prices are firm with the exception of black and galvanized sheets, particularly the latter, on which shading is reported as still a rather common practice. The official schedule of warehouses in this district is still maintained at 5.10c., 5.15c. and 5.50c. per lb. on black and 6.10c., 6.15c. and 6.50c. per lb. on galvanized sheets, but shading to 5c. and 6c. per lb. and lower on black and gal-

vanized respectively is reported. While one warehouse handling cold-rolled shafting and screw stock increased its quotations to 4.65c. per lb. base, other warehouses handling this product are thus far maintaining the previous quotation of 4.40c. per lb. base. No change in quotations on brass and copper products has been made since March. We quote prices on page 1398.

**Finished Iron and Steel.**—Heavy inquiry for steel rails for delivery over the remainder of the year has been a feature of the past week, and it is expected orders will be taken by the mills at the price effective for first half, namely \$43, mill, per gross ton. The New York Central, one of the large buyers in this district, will allocate its orders shortly. The quantity, not definitely announced, is expected to be about 100,000 tons. None of the mills is willing to quote for 1924 delivery, but apparently it is the intention of the railroads to get the steel on the ground some time during the latter half of the year for such work as can be done before cold weather. The intimation in THE IRON AGE, two weeks ago, that rails would be no higher has been substantiated, the mills apparently being desirous of assisting the railroads in getting back to an efficient basis by continuing the first half price. Otherwise there has been little change in the steel situation so far as new business is concerned, but there is decidedly an easier mill condition on some products, notably plates, shapes and bars. One large independent now finds it can make fairly good deliveries from some of its mills and it is quoting bars quite freely at 2.50c., Pittsburgh, while plates are available for shipment in a few weeks at 2.60c. to 2.65c. and structural shapes at 2.50c. to 2.60c., Pittsburgh. The drift of the plate, shape and bar markets to a 2.50c. maximum is more clearly indicated by the week's developments, and while some mills are still able to get higher prices, the tonnages placed at such prices are more frequently such small lots as a carload or less. The structural steel situation is easier in that less new work is coming out and the mills are enabled to foresee a time within the near future when early deliveries will be less difficult to arrange. An instance is cited of two Eastern railroads, the Baltimore & Ohio and the Seaboard Air Line, which were able to place orders for a total of 500 tons or more each for prompt shipment of various steel products. The multiplicity of items and the various shops to which the material was consigned placed the orders in the class of warehouse business, yet mill shipment was obtainable. Less than a month ago another road placed 2500 tons with a warehouse because of inability to obtain mill deliveries. This illustrates the change which the past month or so of restricted buying has brought.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c. to 2.84c.; plates and structural shapes, 2.84c.; bar iron, 2.84c.

**Coke.**—More pronounced weakness has developed and some "distress" furnace coke of good analysis has been quoted at \$4.50, although the usual quotation for early delivery is from \$5.75 to \$6.25. Foundry coke for early shipment is quoted at \$6.75 to \$7.25. Foundry coke for last half is quoted at \$8. By-product coke has been reduced 50c. per ton to \$12.31 from \$12.34. Newark and Jersey City points. Some coke is being sold for export at about \$17.50, delivered, British ports.

**Old Material.**—No improvement is evident as yet. Heavy melting steel dropped off another \$1 in the past week with consumers still showing no particular inclination to buy. Despite the reports that there was a shortage of scrap during the recent period of high prices, today, dealers and brokers claim that they can obtain practically any quantity they might need of almost all grades. Today strictly No. 1 heavy melting steel is quoted at from \$20.50 to \$21 per ton delivered to eastern Pennsylvania consumers and about \$23 per ton delivered western Pennsylvania. Even these prices are largely nominal, as there is very little buying reported. No. 1 yard wrought is quoted at about \$23.25 per ton delivered eastern Pennsylvania and \$22.50 delivered to Rockaway, N. J. A Phoenixville consumer is purchasing some stove plate at \$20 per ton delivered and a Bridgeport consumer of stove plate is offering



\$19 per ton. Borings and turnings shipped to Sparrows Point, Md., are worth \$19 per ton delivered. The buying price on heavy melting steel of railroad quality delivered to Bethlehem is now \$20 per ton.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard.....	\$16.50 to \$17.00
Steel rails, short lengths, or equivalent .....	17.00 to 17.50
Rolls for rolling.....	20.00 to 21.00
Relaying rails, nominal.....	29.00 to 30.00
Steel car axles.....	24.00 to 25.00
Iron car axles.....	26.00 to 27.00
No. 1 railroad wrought.....	19.00 to 20.00
Wrought iron track.....	17.50 to 18.00
Forge fire .....	15.00 to 15.50
No. 1 yard wrought, long.....	19.00 to 19.50
Cast borings (clean).....	15.00 to 15.50
Machine-shop turnings .....	15.00 to 15.50
Mixed borings and turnings.....	14.50 to 15.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	13.50 to 14.50
Stove plate .....	16.00 to 16.50
Locomotive grate bars.....	17.50 to 18.00
Malleable cast (railroad).....	21.00 to 22.00
Cast-iron car wheels.....	22.00 to 23.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$23.50 to \$24.00
No. 1 heavy cast (columns, building materials, etc.), cupola size .....	22.50 to 23.00
No. 1 heavy cast, not cupola size .....	20.50 to 21.00
No. 2 cast (radiators, cast boilers, etc.) .....	18.50 to 19.00

## Boston

### Pig Iron Buying of Filling-in Nature—Importations for April

BOSTON, May 8.—Pig iron business in this territory the past week was nearer a standstill than at any previous period this year. Bookings represented buying for filling in or mixture purposes and in the aggregate were less than 3000 tons. The largest individual lot sold was 300 tons of Alabama, third quarter, at \$27 furnace base. Virginia at \$28.50 furnace base, Buffalo at \$29.50, western Pennsylvania at slightly under \$30, lake charcoal on a basis of \$33.50 furnace for No. 1 foundry, and Continental silicon 2.50 plus at \$35.75 on dock here, duty paid, are included in the week's transactions. Foundries are busy, with most of them covered on iron well into or through the third quarter. Brokers are giving their efforts largely to cleaning up business on their books. Railroad embargoes continue to embarrass furnaces. Wages paid molders vary considerably in this territory. For instance, in a nearby town, 93c. per hour or \$7.20 per day is received, while in a city 82½c. per hour or \$6.60 per day is paid. Boston pays 75c. per hour, or \$6 a day, its agreement with molders expiring Oct. 1.

We quote delivered prices on the basis of the latest reported sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75.....	\$35.15 to \$36.65
East. Penn., sil. 1.75 to 2.25.....	34.65
Buffalo, sil. 2.25 to 2.75.....	34.91 to 35.41
Buffalo, sil. 1.75 to 2.25.....	34.41
Virginia, sil. 2.25 to 2.75.....	34.92 to 35.92
Virginia, sil. 1.75 to 2.25.....	34.42 to 35.42
Alabama, sil. 2.25 to 2.75.....	38.10
Alabama, sil. 1.75 to 2.25.....	37.60

**Iron Importations.**—During the week ending May 5, 11,000 tons of pig iron from Barrow-in-Furness, England, for the American Steel & Wire Co., Worcester, Mass., arrived at this port, whereas in the previous week there were no importations. Aggregate receipts of foreign ore for April were 11,703 tons, made up of 8510 tons English, 2593 tons Belgian, and 600 tons Scotch. March importations amounted to 15,389 tons, consisting of 8022 tons Belgian, 5390 tons Scotch, 1023 tons German, 744 tons English, and 200 tons Nova Scotia. Since Jan. 1, considerably more than 60,000 tons of foreign iron have been received at this port.

**Warehouse Business.**—Cold-rolled steel has advanced \$5 a ton, but warehouse quotations on iron and steel otherwise remain unchanged. The movement out of stock is of large size. Railroad embargoes continue to hold up shipments of nails into this territory, and stocks are badly broken. Crowbars, heavy hammers,

picks and mattocks have advanced about 5 per cent, and wedges 1c. per lb.

**Cast Iron Pipe.**—Inquiries for cast iron pipe continue numerous in this territory, but because of the sold-up condition of foundries little actual business is closing. The only business of importance placed recently was for a five-miles new water supply, late fall delivery, by Clairmont, N. H., with the Warren Foundry & Pipe Co. The market is \$3 a ton higher than a month ago and \$5 instead of \$3 differentials on class A and gas pipe are demanded. Cast iron pipe in car lots, f.o.b. common Boston rate points, is as follows: 4 in., \$70.10 a ton; 6 in. to 14 in., inclusive, \$65.10; 16 in. and up, \$63.10.

**Finished Material.**—Fresh embargoes have cut off mills from the New England market insofar as spot and nearby business is concerned. Previously, a sizable business in wire rods was done, as well as in iron and steel bars. A mill offering steel bars at 2.35c. Pittsburgh base has withdrawn that price, the market now being on a 2.40c. to 2.50c. basis. Plates are firm at 2.60c. and up. Shapes are around 2.50c., with premiums running as high as 2.90c. on short time rollings. New York and Pennsylvania warehouses are offering steel in round tonnages to New England manufacturers at prices which compare favorably with mill quotations. Rails are more active, sales of 2000 ton girder, 500 ton standard T and several smaller ones being made.

Jobbers quote: Soft steel bars, \$3.61½ per 100 lb.; flats, \$4.40; concrete bars, \$3.76½ to \$3.89; structural angles, channels and beams, \$3.71½; tire steel, \$4.80 to \$5.15; open-hearth spring steel, \$8 to \$10; crucible spring steel, \$12; bands, \$4.80 to \$5.30; hoop steel, \$5.80 to \$6.30; cold-rolled steel, \$4.75 to \$5.25; toe calk steel, \$6.15; refined iron, \$3.61½ per 100 lb.; best refined iron, \$4.75; Wayne iron, \$5.50; Norway iron, \$6.60 to \$7.10; steel plates, \$3.71½ to \$3.97½; No. 10 blue annealed sheets, \$4.61½ a 100 lb.; No. 28 black sheets, \$5.65; No. 28 galvanized, \$6.65.

**Coke.**—Aside from a further spread between Connellsville foundry coke and local product prices, nothing of importance has taken place in the market. The New England Coal & Coke Co. and the Providence Gas Co. quote by-product foundry coke at \$16 and \$15 a ton delivered, respectively, within the \$3.10 freight zone. Standard Connellsville foundry fuel is offered at \$12.55 to \$13.55 delivered New England, and special lots of West Virginia at less than \$11 delivered. Connellsville 48-hr. coke is obtainable at \$11.55 to \$12.55 delivered here.

**Old Material.**—The old material situation has not changed. Large consumers continue to hold aloof from the market pending a still lower level of values, while dealers refrain from forcing sales feeling, as most of them do, sagging prices are temporary. In the meantime the undertone of the market is unsettled with a majority of materials worth less than last week. Pennsylvania mills are rejecting materials freely, especially heavy melting steel, except at price reductions averaging \$1 to \$2 a ton. A reduction of as high as \$6 a ton on heavy melting steel is reported. With average delivered prices on machinery cast off perhaps \$2 from the 1923 peak, New England foundries show little interest in such material. Quotations on stove plate are nominal, there being no market for it at the moment.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$26.50 to \$27.00
No. 2 machinery cast.....	24.50 to 25.00
Stove plate .....	19.50 to 20.00
Railroad malleable .....	26.50 to 27.00
Street car wheels.....	24.50 to 25.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$16.50 to \$17.00
No. 1 railroad wrought.....	20.00 to 20.50
No. 1 yard wrought.....	18.50 to 19.00
Wrought pipe (1 in. in diam., over 2 ft. long).....	14.00 to 14.50
Machine shop turnings.....	14.00 to 14.50
Cast iron borings, rolling mill....	15.00 to 15.50
Cast iron borings, chemical.....	17.00 to 17.50
Blast furnace borings and turnings	14.00 to 14.50
Forged scrap and bundled skeleton	14.00 to 14.50
Shafting .....	21.00 to 22.00
Street car axles.....	21.00 to 22.00
Rails for rerolling.....	19.50 to 20.00

## Cincinnati

### Some Price Concession with Sales of Pig Iron Light—Scrap Declines

CINCINNATI, May 8.—The past week produced the smallest inquiry for many months, and today the market is almost devoid of interest. Sales during the past week were also very light, made up mostly of single carloads. One, however, stood out prominently, this being a sale of 2000 tons of Northern iron to a pipe maker at a price reported to be slightly under the market. This iron was for prompt shipment. A central Ohio melter bought 500 tons for third quarter shipment at approximately \$30.50, Ironton, base, while another nearby melter is reported to have closed on 600 tons for the same delivery at \$30.50. The market is soft, due possibly to the fact that a number of furnaces operating in the district are piling iron. There was no activity in southern irons, only occasional carload lots moving at \$27, base, Birmingham, which price continues very firm. There was no activity in basic, Bessemer or silvery irons, and prices remain at last week's levels.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base) . . .	\$31.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft) . . .	31.55
Ohio silvery, 8 per cent. . . . .	41.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2) . . . . .	32.77
Basic Northern . . . . .	32.27
Malleable . . . . .	32.77

**Sheets.**—The leading interest is reported to be allotting the remainder of its third quarter tonnage among its regular customers. It is said that on galvanized sheets, the allotment runs about 25 per cent of the inquiry. Most of the large independent sheet mills are following the American Sheet & Tin Plate Co.'s prices on blue annealed and black sheets, but on galvanized prices usually range \$3 per ton higher, or 5.15c. Some of the smaller mills are quoting for second quarter 3.25c., 4.25c. and 5.25c. respectively, for blue annealed, black and galvanized sheets, and some sales for prompt shipment have been made at prices ranging from \$3 to \$5 per ton above these figures. The demand for third quarter sheets has not become very active.

**Tool Steel.**—Orders continue good for high speed and carbon tool steels, and April was probably the best month locally since late 1920. Prices are firm at 75c. to 95c. for 18 per cent tungsten high speed steel.

**Warehouse Business.**—The month of April was the best month since the depression set in in 1920, and to date in May enough orders have been booked to encourage jobbers to believe that this month will even exceed the April figures. All classes of materials are in demand. Jobbers of sheets have advanced prices \$7 per ton, and on cold-rolled products advances of \$5 per ton became effective May 7.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.50c.; cold-rolled flats, squares and hexagons, 5c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5.35c.; No. 28 galvanized sheets, 6.35c.; No. 9 annealed wire, \$3.60 per 100 lb.; common wire nails, \$3.60 per keg base.

**Finished Material.**—Some consumers are showing interest in third quarter requirements, and as the leading interest and most of the larger independents are booked up for second quarter, this business is being taken at prices prevailing today for indefinite delivery, 2.40c. for steel bars, and 2.50c. for plates and shapes. On early delivery, four to eight weeks, Eastern mills are quoting 2.75c., but some business has been booked at 2.65c. Wire products continue in good demand, with the supply apparently becoming easier. The leading interest is reported to be unable to take on business for less than four months' delivery, but some of the independent mills are reported to be able to make deliveries in six to eight weeks, and on some sizes in two to three weeks. Prices are very strong. For indefinite delivery common wire nails are quoted at \$3 per keg, for six weeks' delivery \$3.10, and for prompt

\$3.15 base. Smooth wire is extremely hard to get. Some third quarter contracts for hoops have been placed at 3.30c. base. There is little activity in light rails or track fastenings, and prices are unchanged. The city of Cincinnati, which recently placed orders for 650 tons of cast iron pipe, will shortly be in the market for an additional tonnage, not estimated as yet. In the structural field, there is little activity. Two new inquiries appeared last week, aggregating 500 tons. Reinforcing bars, however, are active, but mostly in small tonnages. Tank builders are very busy, and many inquiries are coming out for oil tanks for gasoline filling stations, and also for gas holders.

**Coke.**—Fair activity marked the coke market, with prices showing further evidences of declining. Medium sulphur Connellsville coke was being offered today at \$3.75, standard furnace at \$5.75 and foundry at \$6.50 to \$7.50. New River foundry is \$13 to \$14. Wise County furnace at \$6.75 and foundry at \$7.50 to \$7.75, with by-product foundry at \$10 to 11.

**Old Material.**—Further declines were recorded in the scrap market. We note a sale of several thousand tons of cast scrap at \$24 delivered, and 300 tons of wrought were sold around \$21, delivered. Steel grades are not in active demand. The consensus of opinion is that the market will slip further and that a reaction will come about June 1. Railroad offerings are heavy.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets . . . . .	\$16.00 to \$16.50
Iron rails . . . . .	18.50 to 19.00
Relaying rails, 50 lb. and up. . . . .	29.50 to 30.00
Rails for rolling . . . . .	20.50 to 21.00
Heavy melting steel. . . . .	20.50 to 21.00
Steel rails for melting. . . . .	18.50 to 19.00
Car wheels . . . . .	20.00 to 20.50

Per Net Ton	
No. 1 railroad wrought . . . . .	17.00 to 17.50
Cast borings . . . . .	15.00 to 15.50
Steel turnings . . . . .	14.00 to 14.50
Railroad cast . . . . .	20.50 to 21.00
No. 1 machinery cast . . . . .	24.00 to 24.50
Burnt scrap . . . . .	16.00 to 16.50
Iron axles . . . . .	27.00 to 27.50
Locomotive tires (smooth inside) . . . . .	18.50 to 19.00
Pipes and flues . . . . .	13.00 to 13.50

## Birmingham

### Leading Cast Iron Pipe Company Buys Round Tonnage of Pig Iron

BIRMINGHAM, ALA., May 7.—The total of pig iron ordered by the leading pipe interest shortly before May 1 was between 20,000 and 25,000 tons and was for fill-in purposes, principally May and June delivery, although tonnage for third quarter was included. It is understood that failure to get iron ordered heretofore caused the recent purchases. Three and probably four interests shared the business. The \$27 base is said to have been gotten. No other business of consequence was reported last week. One maker booked 100 tons. A few mid-Western orders for 200 tons were received, but the week generally was extremely listless not only as to business booked but also as to inquiries. There was nothing to indicate early reappearance of buyers. However, melt is exceptionally large and deliveries of iron are prompt, hence melters are using up requirements. The Sloss-Sheffield Steel & Iron Co.'s resumption schedule is a city furnace May 15 and the new Sheffield stack by June 15. It will then have seven active furnaces. Iron production for four months of the year is close to the pace of 1917, when the record production of 2,950,000 tons was made. The stock report shows further decline, as reported elsewhere in this issue. In realignment of commodity rates to and from the Southeast, the carriers propose reducing the rates from Pittsburgh on iron and steel articles to Birmingham from 69c. to 58c. Birmingham will ask for the proposed Memphis rate of 56c. Reductions from other Northern points proposed by the carriers are in proportion. The rates, which are expected to conform to the fourth section clause of the transpor-



tation act, are ordered by the Interstate Commerce Commission to go into effect July 1.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25.....	\$27.00
Basic .....	26.00
Charcoal, warm blast.....	34.00

**Cast Iron Pipe.**—Pressure pipe makers are taking 6-in. sizes subject to not earlier than September and October delivery. Prices quoted are subject to change within a week after quoted. The base remains at \$49, although some pipe is sold \$1 and \$2 higher. Sanitary pipe is rather quiet, but makers expect good business out of the Northwest momentarily. Plants are booked to capacity 60 days ahead. The base is \$75.

**Finishing Mills.**—All steel mills remain near 100 per cent of capacity. The Tennessee company's rail mill is understood to be well covered for six months. Cotton tie production is on larger scale than last year. Bars remain at \$2.70c. f.o.b. Birmingham.

**Coal and Coke.**—The accumulations of 50,000 to 60,000 tons of pitch in tar product manufacturers' yards have been moved to Europe for use in manufacture of briquettes. Coke still brings \$9 for spot delivery.

**Old Material.**—The scrap market has been rather listless recently following large purchases of both steel and cast.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Old steel rails.....	\$18.00 to \$20.00
No. 1 steel.....	16.00 to 18.00
No. 1 cast.....	24.00 to 25.00
Car wheels.....	24.00 to 25.00
Tramcar wheels.....	23.00 to 24.00
Stove plate.....	18.00 to 19.00
Cast iron borings.....	12.00 to 13.00
Machine shop turnings.....	12.00 to 13.00

## St. Louis

### Pig Iron Dull—Scrap Lower—More Demand for Finished Steel

ST. LOUIS, May 8.—The market for pig iron continues quiet. What little buying there was was confined to small lots for immediate shipment. There were no large inquiries. While no interest is being shown in third quarter deliveries, melters are pressing for shipments against contracts. The melt continues heavy and foundries are well booked. There is need for laborers and molders. Prices remain unchanged. Northern iron is quoted at \$32, Chicago, while the market on Southern iron is \$27, Birmingham, although some makers not anxious for business quote \$28. The St. Louis Coke & Chemical Co. is quoting \$33 to \$34, Granite City.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$3.28 from Birmingham (rail and water), \$5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy. sil. 1.75 to 2.25.....	\$34.16
Northern malleable, sil. 1.75 to 2.25.....	34.16
Basic .....	34.16
Southern fdy., sil. 1.75 to 2.25.....	32.17

**Finished Iron and Steel.**—An improvement is noted in the demand for finished iron and steel. Sales to fabricators of structural steel were reported. The largest was several hundred tons to a Dallas, Tex., concern. Jobbers were making inquiries for bar material. Some interest is being shown as to third quarter, but the scramble that marked the opening of order books on second half business is lacking. The only railroad inquiries have been for frogs, switches and similar special track material.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, cold rolled, one pass, 5c.; cold drawn rounds, shafting and screw stock, 4.45c.; structural rivets, 4.15c.; boiler rivets, 4.25c.; tank rivets,  $\frac{1}{4}$  in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, square or hexagon blank, \$2.50; and tapped, \$2.50 off list.

**Coke.**—Coke is easing up all along the line. The demand for domestic coke has fallen off considerably as a result of warm weather. Producers are now lining

up dealers for contracts for delivery during the season beginning the latter part of July.

**Old Material.**—Further declines are reported in the market for old material, most items being off from 25c. to \$1 per ton. Consumers simply are not buying, and probably will remain out of the market for the next 30 days, it is believed. Dealers are buying only to fill in. The Missouri-Kansas-Texas Railway has a list of 1600 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails.....	\$20.00 to \$20.50
Rails for rolling.....	21.50 to 22.00
Steel rails, less than 3 ft.....	23.00 to 23.50
Relaying rails, standard section..	37.50 to 39.00
Cast iron car wheels.....	25.00 to 25.50
Heavy melting steel.....	19.00 to 19.50
Heavy shoveling steel.....	18.00 to 18.50
Frogs, switches and guards cut apart .....	20.50 to 21.50

Per Net Ton	
Heavy axles and tire turnings...	15.00 to 15.50
Steel angle bars.....	19.00 to 19.50
Iron car axles.....	27.50 to 28.50
Steel car axles.....	24.00 to 24.50
Wrought iron bars and transoms	24.00 to 24.50
No. 1 railroad wrought.....	18.50 to 19.00
No. 2 railroad wrought.....	18.50 to 19.00
Railroad springs .....	23.75 to 24.25
Steel couplers and knuckles.....	23.75 to 24.25
Cast iron borings.....	14.00 to 14.25
No. 1 busheling.....	17.50 to 18.00
No. 1 railroad cast.....	21.00 to 21.50
No. 1 machinery cast.....	22.00 to 22.50
Railroad malleable.....	21.50 to 22.00
Machine shop turnings.....	12.50 to 13.00

## Buffalo

### Production Heavy, Sales Light—Two More Blast Furnaces Blown In

BUFFALO, May 8.—The continued slackness in demand has not had any effect on prices. The five producers and others offering merchant iron have not receded from the \$29.50 base which they touched six weeks ago. Reports of isolated sales at \$29 are not confirmed. The present period of weakness is probably more pronounced than at any period since the buying slump set in. The largest individual inquiry is one for 500 tons and the others are mostly carloads. The general run of these does not reach a very encouraging total. The situation is not viewed in any pessimistic light, however. The majority of producers have all the second quarter tonnage they care to handle and are satisfied that considerable third quarter business has not been placed and that the proportionate share will come here. Production is at the greatest peak since 1920 and sales at the lowest ebb since the beginning of this year. Rogers, Brown & Co. now have full operation; the fourth Susquehanna stack was placed in blast May 1, and one stack of the recently acquired furnaces of the subsidiary of the American Radiator Co. was lighted May 2. The general situation with all Buffalo producers is kindred to one interest, which is considering shutting off new business for May delivery and considering only third quarter placement. The largest gross business for any producer in April showed total sales of 17,000 tons. Malleable is firm at \$30. No fourth quarter inquiries are out.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.....	\$30.50
No. 2X foundry, 2.25 to 2.75 sil.....	30.00
No. 2 plain, 1.75 to 2.25 sil.....	29.50
Basic .....	30.00
Malleable .....	30.00
Lake Superior charcoal.....	37.28

**Finished Iron and Steel.**—Little of importance has occurred to change the situation. Demand has not speeded up since May 1; offices known to the trade to be behind on deliveries to such an extent that only three and four months' service can be promised, are finding a considerable dropping off in inquiry. Mills not ordinarily active in this territory in normal times are quoting high prices on bars for 30-day delivery and less and have taken some fairly large tonnages in Central New York and the Mohawk Valley. The range of bar prices is from 2.40c. to 2.60c.; and shapes from 2.50c.

to 2.75c. The branch of an independent company, which was open on bars for slightly more than a week, booked tonnages equal to expected production and has again closed order books. The same seller is taking third quarter sheet tonnages.

We quote warehouse prices, Buffalo, as follows:  
Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5.10c.; cold rolled round shafting, 4.45c.

**Old Material.**—Other than dealers buying heavy melting steel from other dealers to fill old contracts, the demand for all grades of old material is dull. The only exception noted is for borings and turnings called for by blast furnaces. No. 1 machinery cast scrap shows marked weakness. Not any Buffalo mill is known to be interested in steel purchases at this time.

Heavy melting steel.....	\$23.50 to \$24.00
Low phos., 0.04 and under.....	27.00 to 28.00
No. 1 railroad wrought.....	21.00 to 21.50
Car wheels.....	23.00 to 23.50
Machine shop turnings.....	18.00 to 19.00
Cast iron borings.....	20.00 to 21.00
No. 1 bushing.....	21.50 to 22.00
Stove plate.....	21.00 to 22.00
Grate bars.....	20.00 to 21.00
Bundled sheet stampings.....	16.00 to 17.00
No. 1 machinery cast.....	24.50 to 25.50
Hydraulic compressed.....	22.00 to 22.50
Railroad malleable.....	27.00 to 28.00

## Philadelphia

### More Steel Business Has Been Placed, but Pig Iron Is Quiet

PHILADELPHIA, May 8.—Third quarter contracts for steel bars, sheets and tin plate have been placed by consumers in this district during the past week and the volume of business taken by the mills has been somewhat larger than in any week since the first of April. A large independent opened its books for steel bars for third quarter at 2.50c., Pittsburgh, but most of the tonnage was already under reservation. Independent makers of sheets and tin plate have quite generally adopted the prices of the American Sheet & Tin Plate Co. for third quarter and have taken substantial orders from their regular customers. There is an easier delivery situation in plates, shapes and bars and the recently quoted peak prices show signs of giving way. It is generally conceded by mill representatives that the three heavy products will soon be generally available for reasonable deliveries at not over 2.50c., Pittsburgh. An interesting feature of the renewed steel buying is in the rail requirements of the railroads for the second half. Substantial orders will be placed soon. The Pennsylvania Railroad has bought 10,000 tons of car plates for May-June shipment.

Not in the dullest periods of the pig iron market have the furnaces taken less business than during the past week, but pressure from foundry consumers for shipments continues, indicating large consumption. Sellers believe that a large pig iron buying movement for third quarter will come not later than June 1. Marked weakness in old material, with prices 50c. to \$2 a ton lower than a week ago, puts the scrap trade in a quandary as to where prices will go.

**Pig Iron.**—Buyers are playing a waiting game, but sellers confidently believe that a large buying movement for third quarter will be under way not later than June 1. Meanwhile current business is almost negligible, consisting mainly of carload lots for prompt shipment. Some furnaces have iron piled which they were unable to ship in April, but their order books for the remainder of this quarter are full and foundry consumers are pressing for shipments, this being particularly true in New England, where the railroad embargo situation is still causing difficulties. Prices on foundry grades are being firmly held, while in basic there have been no transactions to test the market. Furnace quotations continue at \$31 for No. 2 plain, \$32 for No. 2 X and \$33 for No. 1 X from eastern Pennsylvania and New Jersey furnaces, and attempts of a few foundry buyers to obtain concessions have been generally unsuccessful, the only deviation from

these prices being made by brokers who in a few instances have taken off 50c. a ton. Furnace interests and consumers, as well, are watching the coke situation very carefully for its effect on third quarter pig iron prices. Coke now being consumed on second quarter contracts cost the furnaces in this district \$7 a ton at Connellsville ovens, but third quarter contracts have been offered at \$6.50. Furnace operators believe the price will go lower and are holding off. Spot furnace coke from Connellsville is available at \$5.50 and even this could be shaded. Sales of several thousand tons of copper free low phosphorus iron, at \$32, furnace, reported last week, were made by a New York State stack, which has a freight rate of \$5.30 to this district, hence a nearby furnace has made no reduction in its quoted price of \$35, furnace, on the same grade of iron, as its delivered price to consumers near Philadelphia is still lower than that of the New York furnace. Producers of copper bearing low phosphorus quote \$33, furnace. Virginia furnaces now uniformly quote \$29, base, for third quarter or May-June shipment. Imports of foreign iron have practically ceased, none coming in at this port last week.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to \$1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.....	\$31.76 to \$32.64
East. Pa. No. 2X, 2.25 to 2.75 sil.....	32.76 to 33.64
East. Pa. No. 1X.....	33.76 to 34.64
Virginia No. 2 plain, 1.75 to 2.25 sil.....	31.17
Virginia No. 2X, 2.25 to 2.75 sil.....	35.17
Basic delivered eastern Pa.....	31.00 to 31.50
Gray forge.....	29.50 to 30.00
Malleable.....	33.14 to 33.64
Standard low phos. (f.o.b. furnace).....	32.00 to 33.00
Copper bearing low phos. (f.o.b. furnace).....	33.00

#### Foreign Pig Iron

All prices f.o.b. cars Philadelphia, duty paid.	
Continental foundry, 1.80 to 2.50 sil.....	\$31.00
Continental foundry, 2.50 to 3 sil.....	32.00
Low phos. copper free, guar. not over 0.035 per cent phos.....	\$35.00 to 36.00
Continental, phos. 1.50; sil. 2 to 3.....	31.50

**Ore.**—Last week receipts of iron ore from Sweden totaled 21,727 tons. A cargo of 7000 tons of Brazilian manganese ore was received here.

**Ferroalloys.**—The leading domestic producer of ferromanganese quotes \$125 per gross ton, seaboard or furnace, which is the same as the price quoted by agents of the British producers. Spot ferromanganese is quoted at \$130. Very little spiegeleisen is available, but one broker is offering small lots of imported for prompt shipment at \$55, Baltimore. Fifty per cent ferrosilicon is firm at \$95, furnace, for any delivery that furnaces can make. Last week's receipts of ferromanganese from England were 369 tons.

**Semi-Finished Steel.**—There is no change in the situation on billets. Eastern mills quote \$45 on open-hearth rerolling quality and \$55 for forging quality, Pittsburgh basis.

**Rails.**—The Pennsylvania and Philadelphia & Reading railroads are in the market for substantial tonnages of heavy rails for delivery over the remainder of the year and the business probably will be placed soon. The Pennsylvania will probably buy about 30,000 to 40,000 tons and the Philadelphia & Reading 10,000 tons.

**Plates.**—There is a decidedly easier delivery situation in plates, as is evidenced by the fact that the Pennsylvania Railroad was able to place orders totaling 10,000 tons with a number of mills for May-June shipment at prices reported to range from 2.50c. to 2.65c., Pittsburgh, according to the mill. In addition this road has asked for bids from all of the mills for 2000 to 5000 tons each for third quarter, it being expected that orders for not less than 10,000 tons will be placed for delivery in that period. Orders for 3000 to 4000 tons of plates and shapes for car parts are also understood to have been placed in the Pittsburgh district. Eastern mills find that it is not so easy to obtain the recently quoted peak prices for prompt delivery material, and the range of quotations for shipments ranging from two to six weeks is 2.60c. to 2.75c., Pittsburgh, with less and less business being placed at the higher level. The bulk of current business is going at 2.65c. There



is no slowing up in production, for the mills find that the aggregate of small orders is fairly satisfactory, though far less than was being booked each week during the first quarter of the year.

**Structural Material.**—With a marked letting up in the placing of new contracts for buildings the mills are finding their delivery situation somewhat easier. Orders can be placed for shipment in two or three months at 2.50c., Pittsburgh, or contracts for third quarter can be made at that price. For earlier shipment 2.50c. is not always obtainable except where mills can find open spaces in their rolling schedules, as they now do occasionally. Some Eastern mills are still quoting 2.75c. mill, for shipments within a few weeks.

**Bars.**—One large independent has opened its books for third quarter steel bar contracts at 2.50c., Pittsburgh, and has booked a substantial volume of business, a considerable part of which was already reserved for regular customers. The two mills which have named a price of 2.40c. on bars have practically nothing to offer for delivery in the next two or three months. Bar iron is available at 2.50c., Pittsburgh, but some quotations are as high as 2.65c.

**Sheets and Tin Plate.**—Several of the leading independent makers of sheets and tin plate have taken third quarter contracts from their regular customers at the same prices as were recently named by the American Sheet & Tin Plate Co., these being 3c. for blue annealed, 3.85c. for black and 5c. for galvanized. On tin plate some mills at first were inclined to hold to \$6, but later decided to sell at \$5.50, and considerable business has been booked at this figure.

**Warehouse Business.**—There is a steady demand for steel out of stock. Philadelphia jobbers continue to quote the following prices for local delivery:

Soft steel bars and small shapes, 3.55c.; iron bars (except bands), 3.55c.; round edge iron, 3.75c.; round edge steel, iron finished,  $1\frac{1}{2}$  x  $\frac{1}{4}$  in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates,  $\frac{1}{4}$  in. and heavier, 3.65c.; tank steel plates,  $\frac{3}{8}$  in., 3.95c.; blue annealed steel sheets, No. 10 gage, 4.25c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.65c.; structural shapes, 3.65c.; diamond pattern plates,  $\frac{1}{4}$ -in., 5.40c.;  $\frac{3}{8}$ -in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.75c.; narrower than 1 in., all gages, 5.25c.; steel bands, No. 12 gage to  $\frac{3}{8}$ -in., inclusive, 4.35c.; rails, 3.55c.; tool steel, 8.50c.; Norway iron, 7c.

**Old Material.**—Prices of all grades of old material continue to go down. The demand from consumers is not sufficient to check the decline and dealers and brokers are very cautious because of their apparent inability to determine the low point which prices will reach. Although small sales of heavy melting steel have been made within the past few days at \$21.50, delivered Eastern mill, a large dealer is offering only \$20 for shipment to plants of the Bethlehem Steel Co., and it is intimated that this price will be reduced to \$19 before the end of the week. Low phosphorus steel scrap is off about \$2 a ton and on nearly all other grades the decline has ranged from 50c. to \$2 a ton.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$20.00 to \$21.50
Scrap rails .....	20.00 to 21.50
Steel rails for rolling.....	23.00 to 24.00
No. 1 low phos., heavy 0.04 and under .....	27.00 to 29.00
Cast iron car wheels.....	25.00 to 26.00
No. 1 railroad wrought.....	25.00 to 26.00
No. 1 yard wrought.....	23.00 to 24.00
No. 1 forge fire.....	19.00 to 20.00
Bundled sheets (for steel works)	18.50 to 19.50
No. 1 busheling.....	20.50 to 21.50
Mixed borings and turnings for blast furnace use .....	18.00 to 19.00
Machine shop turnings (for steel works use) .....	18.00 to 19.00
Machine shop turnings (for rolling mill use).....	18.50 to 19.00
Heavy axle turnings (or equivalent) .....	19.00 to 20.00
Cast borings (for steel works and rolling mills).....	19.00 to 20.00
Cast borings (for chemical plants)	23.00 to 25.00
No. 1 cast .....	25.00 to 26.00
Heavy breakable cast (for steel plants) .....	21.50 to 22.50
Railroad grate bars.....	19.50 to 20.00
Stove plate (for steel plant use)	19.50 to 20.00
Railroad malleable.....	22.00 to 24.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.50 to 19.50
Shafting .....	24.00 to 26.00
Steel axles .....	24.00 to 26.00

## San Francisco

### Prosperity Rules on the Coast—Improvement in Pig Iron Demand

SAN FRANCISCO, May 2.—Business in all departments of the iron and steel industries on the Pacific Coast is reported as satisfactory. Contrary to the expectations of some interested branches of trade, the high prices have not acted as a barrier to operations in either steel construction or foundry work. The building permits in all the large cities of the Coast show a substantial increase not only in number but in valuation totals, as compared with the corresponding period of last year. The building program in Los Angeles and several other of the principal centers of population in the southern part of the State has attained very large proportions, and there is every indication that the activity will continue through the summer months.

**Pig Iron.**—The market maintains a steadiness equally applicable to prices and trade volume that is particularly gratifying because of its apparent permanence. While Coast prices are substantially unchanged as compared with a month ago, importers say there is a stronger undertone noticeable here as compared with two weeks ago. As a base price standard for the present, \$37 to \$38 is said to be a fair average. There is a moderate sale of tonnage on the Coast and values are well sustained. A feature of the market for the last two weeks is the increased number of inquiries, especially from the southern part of the State. There has been unusual activity in the oil fields of Los Angeles and other oil producing counties since the first of the present year and naturally there is an enlarged demand for castings and a variety of finished steel products. In this part of the State, there has been considerable buying of domestic iron by the smaller foundries, chiefly because they are well stocked up with supplies of foreign. It is now difficult to purchase the foreign product. A considerable tonnage of domestic is now being sold for delivery in 60 to 90 days. The bulk of present buying, however, is by the large establishments.

**Finished Iron and Steel.**—The demand for all descriptions of structural steel and merchant bars continues of good volume and prices are firmly held. The quotation at present is said to be \$3.25 per 100 lb., although a small order might bring a fraction above this figure. The rate as stated, however, is generally accepted as the ruling price. Trade is reported as better distributed now than for several months, and a notable increase in volume is announced in the southern part of the State. In at least three of the central interior counties, orders are being placed for bridge material, and marked increase in municipal construction work, mainly school buildings, in several of the larger cities.

**Coke.**—While there is not much being done for the present, the market can scarcely be said to be dull. Prices remain steady, Birmingham by-product being held at \$12.50 to \$13 per ton and West Virginia "beehive" at from \$14 to \$15 f.o.b. at the oven. As there is now no foreign coke on the way and none likely to be for an indefinite period there is no business in this commodity. The small amount of tonnage en route was ordered some time ago and is all engaged. The sales of domestic are of fair proportions with a tendency toward an increase in volume. As a matter of fact, the domestic coke is preferred on this coast because being handled but once or twice en route, it comes to hand in much better shape than the foreign product, which, after being handled four or five times, is considerably broken up. Supplies of domestic coke are ample but there is no shading of prices and some importers say the price may be higher.

**Old Material.**—Foundries are purchasing freely, the prevailing high prices apparently having no adverse influence on trade conditions. Prices show but little variation, ranging from \$14.50 to \$16, although it would require a strictly desirable lot to bring the last named figure. The demand is better now than for

several weeks and buyers say they could use from 50,000 to 100,000 tons at once if they could get it. There is no indication of easiness in prices and if the present inquiry continues there is some likelihood of an advance. Recently the demand for bars for reinforcement of concrete has greatly broadened and in some parts of the State there is a scarcity. The buying inquiry for angle, channel and bar iron is also of very liberal proportions.

## Cleveland

### Wages of Iron Miners Advanced—Pig Iron Market Weak—Some Reselling

CLEVELAND, May 8.—Ore shippers were advised Saturday by railroads handling ore in Michigan and Wisconsin that the new ore rates from the mines to the shipping ports in those States recently ordered reduced by the Interstate Commerce Commission will be placed in effect May 15. The new tariff will be filed with the commission May 10 under the regulations requiring the filing of rate changes five days before they become effective. The Interstate Commerce Commission in its rate decision ordered new rates to become effective on or before June 11. Since its decision, mining companies have been shipping only direct ore from the Michigan and Wisconsin mines, holding back on stock piles, as well as delaying the start of operations in the open pit mines until the lower rail rates become effective. The Michigan and Wisconsin railroads realized that delay in reducing rates would result in a congestion of the ore movement later and a probable loss in revenue as mining companies would push operations in Minnesota, while activities in the other two States would be rather limited. Consequently the Michigan and Wisconsin railroads are putting their reduced rates in effect as soon as possible.

A wage advance averaging about 10 per cent for miners has been announced by the Oliver Mining Co. and several of the independent mining companies which had been waiting for action on wage advances by the Steel Corporation have followed a similar advance. The wage advance will be effective from May 1, and it is probable that practically all the mining companies will grant their men the advance.

The first ore cargo for the season reached Cleveland May 5 from Escanaba, and several cargoes were shipped from the head of the lakes early this week. Although no ore was shipped during April, the monthly report of the Lake Superior Iron Ore Association shows shipments for the month of 14,184 tons. This represents two cargoes that were loaded during April, but did not leave port until May. It is expected that shipments will be well under way by May 15. The opening of the Soo for navigation this year was the latest since 1904 and the late opening of the season for ore shipments is expected to result in a heavy movement during the next few weeks.

**Pig Iron.**—Buyers continue to mark time. A few small lot sales of foundry iron for early shipment were made during the week, but very little third quarter business is being booked, and there is considerable speculation in the trade as to when a new buying movement for that delivery will start. Many consumers have not yet bought iron for the third quarter. One lake furnace during the week sold 2000 tons of foundry iron for the third quarter, but scarcely any iron was sold by other producers, and little inquiry is pending. Lake furnaces are still quoting foundry and malleable iron at \$31.50 to \$32 and Valley furnaces at \$31, but the market has weak spots and it is uncertain what prices will be brought out by an inquiry of sufficient size to test the market. The price situation is being affected by resale iron in both basic and foundry grades, that is being offered at \$30, but apparently not in large quantities. In view of the inactivity, producers do not seem inclined to meet this price on small lot inquiries. A favorable feature of the market is that the melt is keeping up and consumers continue to crowd

the furnaces for shipments. In a few cases foundries have asked furnaces to anticipate shipments on June iron, asking for May deliveries. The Hanna Furnace Co. blew in May 4 its second Detroit stack, which has been out of blast several weeks for repairs.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron includes a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 rate from Birmingham:

Basic, Valley furnace.....	\$31.00
Northern No. 2 fdy., sil. 1.75 to 2.25 .....	\$32.15 to 32.77
Southern fdy., sil. 1.75 to 2.25....	33.00
Malleable .....	32.15 to 32.77
Ohio silvery, 8 per cent.....	42.52
Standard low phos., Valley furnace .....	36.00

**Ore Stocks.**—Ore shipments from Lake Erie docks during April were 1,852,722 gross tons, as compared with 674,126 tons during April last year. The balance on Lake Erie docks May 1 was 4,857,542 tons, or the smallest amount on that date since 1917. The amount on dock on May 1 last year was 7,635,696 tons.

**Bolts, Nuts and Rivets.**—Specifications continue fairly heavy, but not much new business is coming out. There is still a spread of about 10 per cent in bolt and nut quotations, as some makers have not advanced to present published prices. Rivet prices are firmer and there is a possibility that makers who have been quoting 2.25c. for structural and 2.35c. for boiler will advance prices \$2 a ton.

**Semi-finished Steel.**—The market is not active, although some inquiry is coming out for sheet bars for third quarter delivery, for which a local mill is making reservations. While prices are not well defined, about \$45 appears to be the market on sheet bars, billets and slabs.

**Finished Material.**—The supply of steel has become somewhat more plentiful, as at least two large independent mills, one of which has kept out of the market for several weeks until it could catch up on deliveries, are now booking orders for third quarter. Prices are showing a tendency downward to the Steel Corporation levels and some of the mills are not asking as high premiums as they have recently for early shipment of material. The volume of new business is good and there is no easing up in the demand for shipments on contracts. Manufacturers of automobile forgings and other parts are as insistent as other consumers for deliveries, although there are signs of a little slowing down in the automotive industry. A heavy tonnage is still being offered to the leading interest, which is entering orders to the extent that shipments are being made on old contracts. Steel bars are quoted at 2.40c. to 2.50c., with some mills asking higher prices for prompt shipment, although we note the sale of a several hundred ton lot for early shipment at 2.45c. A Youngstown mill has booked a large tonnage of plates at 2.50c. for third quarter for early shipment. The 3c. price appears to have disappeared. Local mills are quoting 2.85c. and Eastern mills 2.80c. to 2.90c. Structural material ranges from 2.50c. to 2.65c. Hoop can be bought at 3.15c. for extended deliveries in the heavier sizes, although some mills are quoting up to 3.50c. Building work continues quiet, but considerable inquiry is coming from railroads for bridge work. An Ohio fabricator during the week took protection on 7000 tons of steel mostly for railroad work.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.90c.; No. 10 blue annealed sheets, 3.90c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

**Sheets.**—The sheet situation is easier and prices quoted by independent mills are tending towards those named by the American Sheet & Tin Plate Co. Automobile companies are not pressing mills for deliveries to the extent that they have been, and in some cases have suspended shipments. Some mills are booking black sheet orders for early shipment and are quoting these at 3.85c., although 4c. appears to be the more common price for early delivery. Blue annealed sheets are 3.25c. to 3.40c. and galvanized 5c. to 5.25c. for early



delivery. A Valley mill is booking orders for the third quarter at 3.85c. for black and 3c. for blue annealed in No. 12 gage and heavier, 3.25c. for No. 13 gage and lighter and 5c. for galvanized.

**Reinforcing Bars.**—The demand has fallen off and the market on rail steel is not as firm as it has been. While rerolling mills are still asking 2.50c., a desirable order would probably bring out a 2.40c. price.

**Coke.**—The foundry coke market is weak, with prices ranging from \$7 to \$7.50 for standard Connellsville makes. There is little activity, as foundries are using up their surplus stocks and buying only from hand to mouth.

**Old Material.**—The market continues inactive and as a result prices have further declined from 50c. to \$1 or more a ton. Mills are keeping out of the market and there is no indication of an early renewal of buying. Dealers are doing virtually no trading in view

of the fact that they have covered on old orders and will not start buying until there is a new demand from the mills. With the declining market there seems to be a little disposition on the part of dealers to speculate.

We quote per gross ton f.o.b. Cleveland as follows:

Heavy melting steel.....	\$22.25 to \$22.50
Rails for rolling.....	24.00 to 24.50
Rails under 3 ft.....	23.50 to 23.75
Low phosphorus melting.....	25.00 to 25.25
Cast borings.....	17.50 to 17.75
Machine shop turnings.....	17.25 to 17.50
Mixed borings and short turnings.....	17.25 to 17.50
Compressed sheet steel.....	20.25 to 20.50
Railroad wrought.....	18.50 to 19.00
Railroad malleable.....	28.00 to 28.50
Light bundled sheet stampings.....	12.75 to 13.00
Steel axle turnings.....	19.00 to 19.25
No. 1 cast.....	27.00 to 28.00
No. 1 busheling.....	16.00 to 16.50
Drop forge flashings.....	19.00 to 20.00
Railroad grate bars.....	21.00 to 21.50
Stove plate.....	21.00 to 21.50
Pipes and flues.....	15.00 to 15.25

## FABRICATED STEEL BUSINESS

Structural steel awards during the past week, as reported to THE IRON AGE, totaled about 13,000 tons, while new projects pending total about 8000 tons. Awards and inquiries are as follows:

School building at New Haven, Conn., 1000 tons, to American Bridge Co.

Trenton Trust Co. building, Trenton, N. J., 1000 tons, to American Bridge Co.

Peabody Museum of Natural History, Yale University, New Haven, Conn., 500 tons, to Levering & Garrigues Co.

Security Building, Springfield, Mass., 550 tons, to Levering & Garrigues Co.

Synagogue and social club, Newark, N. J., 500 tons, to Hedden Iron Construction Co.

Loft building on Seventh Avenue, New York, 850 tons, to A. E. Norton, Inc.

School No. 121, Manhattan, New York, 450 tons, to Easton Structural Steel Co.

Public Service Corporation of New Jersey, addition to power plant, 250 tons, to Pittsburgh Bridge & Iron Works.

Gas plant addition in Brooklyn, 400 tons, to Berlin Construction Co.

Saks' department store, Fifth Avenue, New York, 800 tons, to Hay Foundry & Iron Works, this being additional to 7000 tons let to same fabricator some time ago.

Butler Building Corporation, Chicago, 1184 tons, to Hansell Elcock Co.

Illinois Central, 12 deck plate girder spans, Spalding, Ill., 692 tons, to American Bridge Co.

Cherry Street Bridge, Appleton, Wis., 798 tons, to Wausau Iron Works.

Highway spans in Louisiana, 187 tons, to unnamed fabricator.

Buckle plates on lock gates for Dams 36, 38 and 44, Ohio River, 160 tons, to Nashville Bridge Co. and John Eichley, Jr., Pittsburgh.

Two hundred and twenty-ft. riveted span near Chehalis, Wash., 123 tons, to Wallace Equipment Co., Seattle.

State armory, Peoria, Ill., 190 tons, to Indiana Bridge Co.

Bank, Newburgh, N. Y., 260 tons, to Eastern fabricator.

Great Northern, two 98-ft. through plate girder spans, 220 tons, to unnamed fabricator.

Gas holder at Louisville, Ky., reported last week as two holders involving 500 tons of steel, has been changed to one 1,000,000 cu. ft. holder involving 1000 tons, to Stacey Mfg. Co.

Gas holder, Detroit, 800 tons, to Stacey Mfg. Co.

Oil storage tanks, Winchester, Ind., 100 tons, to Stacey Mfg. Co.

Masonic Temple, Madison, Wis., 350 tons, to Worden-Allen Co.

Sprague Electric Co., extension to New Kensington, Pa., works, 100 tons, to Jones & Laughlin Steel Corporation.

State Mutual Life Insurance Co., Worcester, Mass., additional 600 tons, to New England Structural Co.

Addition to Wigmore Coliseum, Cleveland, 300 tons, to McClintic-Marshall Co.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

Johnstown, Pa., highway bridge, tentatively awarded to American Bridge Co., is not going ahead.

Fordham University, New York, gymnasium, 300 tons.

Staten Island tunnel shaft, New York, 1300 tons, bids to be received by city of New York up to May 18.

Masonic Building, New Haven, Conn., 600 tons.

Chicago & Alton, Bridge No. E. 3408, Auxvasse, Mo., 500 tons, bids taken.

Great Northern, Bridges Nos. 122.8 and 132.1, 120 tons.

Elks' Club, Milwaukee, 2500 tons, bids ran too high and building will be redesigned.

Widening Folsom Street viaduct, Milwaukee, 500 tons; bids opened May 1. Wisconsin Bridge & Iron Co. apparent low bidder.

Filter and dryer house for municipal sewage disposal plant at Milwaukee, 100 tons. Bids close May 11.

Frank Smith Paper Co., Middletown, Ohio, factory, 300 tons, bids closed May 7.

Municipal stadium, Terre Haute, Ind., 500 tons.

Rock Island Railroad, bridges, 2690 tons.

Ford Motor Co., trestle at River Rouge plant, 250 tons.

State bridge at Grand Haven, Mich., 700 tons.

## RAILROAD EQUIPMENT BUYING

### Few Inquiries for New Cars, But Repair Orders Are Placed

Orders and inquiries include the following:

The Pennsylvania Railroad is in the market for car parts requiring about 5000 tons of steel, the assembling to be done in its own car shops.

The Elgin, Joliet & Eastern Railroad has ordered 300 steel underframes for freight cars from the Ryan Car Co. and 200 from J. W. Heggie & Sons, Inc.

The Atlantic Coast Line has placed an order with the Rodger Ballast Car Co. for 50 ballast cars.

The American Refrigerator Transit Co. has ordered repairs to 150 refrigerator cars, the work going to the Koppel Car Repair Co.

The Chesapeake & Ohio Railroad has taken bids on 1000 cars and the orders are expected shortly.

The Chicago & Alton Railroad is about to place orders for the repair of 300 gondola cars.

The Canadian Pacific Railway Co. has placed an order with the Montreal Locomotive Works for 20 Mikado-type locomotives.

The Missouri Pacific has placed an order with the American Locomotive Co. for 50 locomotives.

The Minnesota Steel Co. is inquiring for 44 hopper cars in addition to the 20 flat and 20 gondola cars reported last week.

The Burlington is inquiring for 600 to 800 steel gondola car repairs.

Live Poultry Transportation Co. is building 100 poultry cars in its own shops.

The New York Central has ordered four baggage and mail cars from the Standard Steel Car Co.

The Canadian National Railways are in the market for 12 steel underframes.

The Florida East Coast is inquiring for one dining car.

The Lehigh Valley Railroad is inquiring for 10 locomotives.

# Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

## Plates

Sheared, tank quality, base, per lb. .... 2.50c. to 2.60c.

## Structural Material

Beams, channels, etc., base, per lb. .... 2.50c. to 2.60c.

Sheet piling .... 2.65c. to 2.75c.

## Iron and Steel Bars

Soft steel bars, base, per lb. .... 2.40c. to 2.50c.

Soft steel bars, screw stock quality .... \$3 per ton over base

Reinforcing steel bars, base .... 2.40c. to 2.50c.

Refined iron bars, base, per lb. .... 3.25c.

Double refined iron bars, base per lb. .... 4.85c. to 5.00c.

Stay bolt iron bars, base, per lb. .... 8.00c. to 8.50c.

## Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb. 3.30c. to 3.50c.

Hoops, light gage, under 1 in. wide .... 3.75c.

Bands, base, per lb. .... 3.30c. to 3.50c.

Strips, base, per lb. .... 3.30c. to 3.50c.

Cotton ties, per bundle of 45 lb. .... 1.60c.

## Cold-Finished Steels

Bars and shafting, base, per lb. .... 3.25c.

Strips, base, per lb. .... 5.25c. to 5.50c.

## Wire Products

Nails, base, per keg .... \$3.00

Galvanized nails, 1 in. and over .... \$2.25 over base

Galvanized nails, less than 1 in. .... \$2.50 over base

Bright plain wire, base, No. 9 gage per 100 lb. .... 2.75

Annealed fence wire, base, per 100 lb. .... 2.90

Spring wire, base, per 100 lb. .... 3.70

Galvanized wire, No. 9, base, per 100 lb. .... 3.35

Galvanized barbed, base, per 100 lb. .... 3.80

Galvanized staples, base, per keg .... 3.80

Painted barbed wire, base, per 100 lb. .... 3.45

Polished staples, base, per keg .... 3.45

Cement coated nails, base, per count keg .... 2.70

Woven fence, carloads (to jobbers) .... 67½ per cent off list

Woven fence, carloads (to retailers) .... 65 per cent off list

## Bolts and Nuts

Machine bolts, small, rolled threads .... 50 per cent off list

Machine bolts, small, cut threads .... 40 and 10 per cent off list

Machine bolts, larger and longer .... 40 and 10 per cent off list

Carriage bolts, ¾ x 6 in. .... 45 per cent off list

Smaller and shorter, rolled threads .... 45 per cent off list

Cut threads .... 40 per cent off list

Longer and larger sizes .... 40 per cent off list

Lag bolts .... 50 per cent off list

Plow bolts, Nos. 1, 2 and 3 heads .... 40 and 10 per cent off list

Other style heads .... 20 per cent extra

Machine bolts, c.p.c. and t. nuts, ¾ x 4 in. .... 35 and 5 per cent off list

Smaller and shorter .... 35 and 5 per cent off list

Larger and longer sizes .... 35 and 5 per cent off list

Hot pressed square or hex. nuts, blank .... \$3.00 off list

Hot pressed nuts, tapped .... 2.75 off list

C.p.c. and t. square or hex. nuts, blank .... 3.00 off list

C.p.c. and t. square or hex. nuts, tapped .... 2.75 off list

Semi-finished hex. nuts: ¾ in. and smaller, U. S. S. .... 75 and 5 per cent off list

¾ in. and larger, U. S. S. .... 70 and 2½ per cent off list

Small sizes, S. A. E. .... 75, 10 and 5 per cent off list

S. A. E. ¾ in. and larger .... 75, 10 and 2½ per cent off list

Stove bolts in packages .... 75, 10, 5 and 2½ per cent off list

Stove bolts in bulk .... 75, 10, 5 and 2½ per cent off list

Tire bolts .... 50, 10 and 10 per cent off list

## Cap and Set Screws

Milled square and hex. head cap screws, 70 and 10 per cent off list

Milled set screws .... 70 and 10 per cent off list

Upset cap screws .... 75 per cent off list

Upset set screws .... 75 per cent off list

## Rivets

Large structural and ship rivets, base, per 100 lb. .... \$3.25 to \$3.50

Large boiler rivets, base, per 100 lb. .... 3.35 to 3.60

Small rivets .... 60 and 10 to 60 and 5 off list

## Track Equipment

Spikes, ¾ in. and larger, base, per 100 lb. .... \$3.15

Spikes, ½ in. ¾ in. and ¾ in., per 100 lb. .... 3.75

Spikes, ¾ in. .... 3.75

Spikes, boat and barge, base, per 100 lb. .... \$3.50 to 3.75

Track bolts, ¾ in. and larger, base, per 100 lb. 4.25 to 4.50

Track bolts, ½ in. and ¾ in., base, per 100 lb. 5.50

Tie plates, per 100 lb. .... 2.55 to 2.60

Angle bars, base, per 100 lb. .... 2.75

## Welded Pipe

### Butt Weld

Inches Steel Black Galv. Iron Black Galv.

¾ .... 45 19½ ¾ to ¾ .... 51 25½ ¾ .... 56 42½ ¾ .... 60 48½ 1 to 3 .... 62 50½

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¾ .... 45 19½ ¾ to ¾ .... 51 25½ ¾ .... 56 42½ ¾ .... 60 48½ 1 to 3 .... 62 50½

## Lap Weld

2 ..... 55 43½ 2 ..... 23 7

2½ to 6 ..... 59 47½ 2½ ..... 26 11

7 and 8 ..... 56 43½ 3 to 6 ..... 28 13

9 and 10 ..... 54 41½ 7 to 12 ..... 26 11

11 and 12 ..... 53 40½

## Butt Weld, extra strong, plain ends

1½ ..... 41 24½ ¼ to ¾ ..... 19 +54

1½ to ¾ ..... 47 30½ ¾ ..... 21 7

1½ ..... 53 42½ ¾ ..... 28 12

1 to 1½ ..... 60 47½ 1 to 1½ ..... 30 14

2 to 3 ..... 61 50½

## Lap Weld, extra strong, plain ends

2 ..... 53 42½ 2 ..... 23 9

2½ to 4 ..... 57 46½ 2½ to 4 ..... 29 15

4½ to 6 ..... 56 45½ 4½ to 6 ..... 28 14

7 and 8 ..... 52 39½ 7 to 8 ..... 21 7

9 and 10 ..... 45 32½ 9 to 12 ..... 16 2

11 and 12 ..... 44 31½

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent, on galvanized.

## Boiler Tubes

2 to 2½ in. .... 27 1½ in. .... +18

2½ to 2¾ in. .... 37 1¾ to 1½ in. .... +8

3 in. .... 40 2 to 2½ in. .... 7

3½ to 3¾ in. .... 42½ 2½ to 3 in. .... 2

4 to 13 in. .... 46 3¾ to 4½ in. .... 9

\* Less carload lots 4 points less.

## Standard Commercial Seamless Boiler Tubes

1 in. .... 55 2½ and 2¾ in. .... 32

1½ and 1¾ in. .... 47 3 and 3½ in. .... 39

1¾ in. .... 31 3½ and 3¾ in. .... 37

2 and 2½ in. .... 22 4 in. .... 41

3 and 3½ in. .... 38 4½ in. and 5 in. .... 33

## Hot Rolled

3 and 3½ in. .... 38 3½ in. and 3¾ in. .... 39

4 in. .... 41

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

Carbon under 0.30, base .... 83 per cent off list

Carbon 0.30 to 0.40, base .... 81 per cent off list

Plus usual differentials and extras for cutting.

## Seamless Locomotive and Superheater Tubes

2-in. O.D. 12 gage .... 15 2½-in. O.D. 10 gage .... 20

2-in. O.D. 11 gage .... 16 3-in. O.D. 7 gage .... 35

2-in. O.D. 10 gage .... 17 1½-in. O.D. 9 gage .... 15

2½-in. O.D. 12 gage .... 18 5½-in. O.D. 9 gage .... 55

2½-in. O.D. 11 gage .... 18 5½-in. O.D. 9 gage .... 57

## Tin Plate

Standard cokes, per base box .... \$5.50 to \$6.00

## Terne Plate

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. .... \$11.00 20-lb. coating I. C. .... 14.90

base .... 11.30 25-lb. coating I. C. .... 16.20

8-lb. coating I. C. .... 12.70 30-lb. coating I. C. .... 17.35

12-lb. coating I. C. .... 13.95 35-lb. coating I. C. .... 18.35

15-lb. coating I. C. .... 13.95 40-lb. coating I. C. .... 19.35

## Sheets

Nos. 9 and 10 (base), per lb. .... 3.00c. to 3.35c.

No. 28 (base), per lb. .... 3.85c. to 4.25c.

## Automobile Sheets

Regular auto body sheets, base (22 gage), per lb. .... 5.35c. to 5.60c.

No. 28 (base), per lb. .... 5.00c. to 5.50c.

No. 28 gage (base), 8-lb. coating, per lb. .... 5.30c.

No. 28 (base), per lb. .... 3.85c. to 4.25c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

## Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic	\$0.32	Buffalo	\$0.26	St. Louis	\$0.43	Pacific Coast	\$1.34
Philadelphia, export	0.235	Cleveland	0.21	Kansas City	0.735	Pac. Coast, ship plates	1.20
Baltimore, domestic	0.31	Cleveland, Youngstown	0.21	Kansas City (pipe)	0.705	Birmingham	0.69
Baltimore, export	0.225	Comb.	0.19	St. Paul	0.60	Memphis	0.38
New York, domestic	0.34	Detroit	0.29	Omaha	0.705	Jacksonville, all rail	0.50
New York, export	0.255	Cincinnati	0.29	Omaha (pipe)	0.735	Jacksonville, rail and water	0.41
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.27	New Orleans	0.51
Boston, export	0.255	Chicago	0.34	Denver (pipe)	1.215		



# Prices of Raw Materials, Semi-Finished and Finished Products

## Ores

### Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron.....	\$6.45
Old range non-Bessemer, 51½ per cent iron.....	5.70
Messabi Bessemer, 55 per cent iron.....	6.20
Messabi non-Bessemer, 51½ per cent iron.....	5.55

### Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian.....	12c.
Iron ore, Swedish, average 66 per cent iron.....	9.5c. to 10c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	48c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus.....	43c.
Manganese ore, Brazilian or Indian nominal.....	45c.
Tungsten ore, per unit, in 60 per cent concentrates.....	\$8.50
Chrome ore, basic, 48 per cent Cr <sub>2</sub> O <sub>3</sub> , crude per ton, c.i.f. Atlantic seaboard.....	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS <sub>2</sub> , New York.....	75c. to 85c.

## Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$130.00 to \$135.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid.....	125.00
Spiegeleisen, foreign, 19 to 21 per cent, seaboard, per ton.....	45.00 to 55.00
Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton, nominal.....	39.00
Ferrosilicon, 50 per cent, delivered per gross ton.....	35.00
Ferrosilicon, Bessemer, 10 per cent, per ton, furnace.....	48.50
Ferrosilicon, Bessemer, 11 per cent, per ton, furnace.....	51.80
Ferrosilicon, Bessemer, 12 per cent, per ton, furnace.....	55.10
Ferrosilicon, Bessemer, 13 per cent, per ton, furnace.....	59.10
Ferrosilicon, Bessemer, 14 per cent, per ton, furnace.....	64.10
Silvery iron, 6 per cent, per ton, furnace.....	37.00
Silvery iron, 7 per cent, per ton, furnace.....	38.00
Silvery iron, 8 per cent, per ton, furnace.....	39.50
Silvery iron, 9 per cent, per ton, furnace.....	41.50
Silvery iron, 10 per cent, per ton, furnace.....	43.50
Silvery iron, 11 per cent, per ton, furnace.....	46.80
Silvery iron, 12 per cent, per ton, furnace.....	50.10
Ferrotungsten, per lb. contained metal.....	88c. to 90c.
Ferrobromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered.....	12c.
Ferrobromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr. per lb.....	11.50c.
Ferrovandium, per lb. contained vanadium.....	\$3.50 to \$4.00
Ferrocobaltanium, 15 to 18 per cent, per net ton.....	200.00

## Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica per net ton f.o.b. Illinois and Kentucky mines.....	\$20.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica per net ton, f.o.b. Illinois and Kentucky mines.....	21.50
Per 1000 f.o.b. works:	
Fire Clay:	
Pennsylvania.....	High Duty \$48.00 to \$51.00 Moderate Duty \$43.00 to \$46.00
Ohio.....	45.00 to 47.00 40.00 to 43.00
Kentucky.....	45.00 to 47.00 42.00 to 45.00
Illinois.....	48.00 to 50.00 45.00 to 47.00
Missouri.....	48.00 to 50.00 38.00 to 43.00
Ground fire clay, per net ton.....	6.50 to 9.50
Silica Brick:	
Pennsylvania.....	47.00
Chicago.....	52.00
Birmingham.....	48.00
Ground silica clay, per net ton.....	10.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00
Chrome Brick:	
Standard size, per net ton.....	50.00

## Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$45.00 to \$46.00
Rolling billets, 2-in. and under.....	45.00 to 46.00
Forging billets, ordinary carbons.....	55.00 to 58.00
Sheet bars, Bessemer.....	45.00 to 46.00
Sheet bars, open-hearth.....	45.00 to 46.00
Slabs.....	45.00 to 46.00
Wire rods, common soft, base, No. 5 to ¼-in.....	51.00 to 55.00
Wire rods, common soft, coarser than ¼-in.....	\$2.50 over base
Wire rods, screw stock.....	35 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3 per ton over base
Wire rods, carbon 0.41 to 0.55.....	35 per ton over base
Wire rods, carbon 0.56 to 0.75.....	\$7.50 per ton over base
Wire rods, carbon over 0.75.....	\$10 per ton over base
Wire rods, acid.....	\$15 per ton over base
Skelp, grooved, per lb.....	2.50c.
Skelp, sheared, per lb.....	2.50c.
Skelp, universal, per lb.....	2.50c.

## Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton.....	\$43.00
Rails, light, new steel, base, per lb.....	2.25c.
Rails, light, rerolled, base, per lb.....	2.25c.
Spikes, ½-in. and larger, base, per 100 lb.....	\$3.15 to \$3.25
Spikes, ½-in., ⅞-in. and 1-in., base, per 100 lb.....	3.25 to 3.75
Spikes, ¾-in., base, per 100 lb.....	3.25 to 3.75
Spikes, boat and barge, base, per 100 lb.....	3.50 to 3.75
Track bolts, ¾-in. and smaller, base, per 100 lb.....	4.25 to 5.50
Track bolts, ¾-in. and larger, base, per 100 lb.....	4.25 to 4.50
Tie plates, per 100 lb.....	2.55 to 2.60
Angle bars, per 100 lb.....	2.75
Bars, common iron, base, per lb.....	2.50c. to 2.60c.
Bars, rail, steel reinforcing, base, per lb.....	2.15c. to 2.25c.
Ground shafting, base, per lb.....	3.65c.
Cut nails, base, per keg.....	\$3.40

## Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100 (½% Nickel, 10 to 20 per cent Carbon)...	\$3.75
2300 (¾% Nickel).....	6.75
2500 (5% Nickel).....	8.25
3100 (Nickel Chromium).....	4.75
3200 (Nickel Chromium).....	6.50
3300 (Nickel Chromium).....	8.75
3400 (Nickel Chromium).....	7.75
5100 (Chromium Steel).....	4.25
5200 (Chromium Steel).....	8.50
6100 (Chromium Vanadium bars).....	\$5.35 to 5.50
6100 (Chromium Vanadium spring steel).....	5.00 to 5.25
9250 (Silico Manganese spring steel).....	4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium).....	5.75
Chromium Molybdenum bars (0.70-1 Chromium, 0.25-0.40 Molybdenum).....	5.25 to 5.50
Chromium Molybdenum spring steel (0.50-0.70 Chromium, 0.15-0.25 Molybdenum).....	5.00 to 5.35

Above prices are for hot-rolled alloy steel bars, forging quality, per 100-lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are \$10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of \$10 per gross ton; on billets smaller than 2½-in. sq. the net ton bar price applies.

## Will Introduce Bill for Department of Mines

WASHINGTON, May 8.—Senator Tasker L. Oddie, of Nevada, in the course of remarks made before the Washington section of the American Institute of Mining and Metallurgical Engineers, announced that he would introduce a bill at the next session of Congress providing for a Department of Mines. The statement was made in connection with a plea that the institute take a more active part in legislative matters concerning the mining industry. Senator Oddie declared that

neglect of the factors of marketing and storage in the coal mining industry is the cause of the recurrent serious condition of that industry and claimed that had a department of mines been established more than a decade ago, the necessary machinery would have been provided to solve the problem. The suggestion of Senator Oddie to establish a department of mines is not a new one. The late Senator Nicholson of Colorado had a bill in Congress for the creation of such a department, but it never received serious consideration before that body.

## NON-FERROUS METALS

### The Week's Prices

Cents per Pound for Early Delivery									
	Copper, New York		Tin Straits		Lead		Zinc		
	Lake	Electro-lytic*	New York	New York	St. Louis	New York	St. Louis		
May 2.....	16.75	16.37½	45.50	7.75	7.50	7.20	6.85		
3.....	16.75	16.25	45.62½	7.50	7.25	7.30	6.95		
4.....	16.75	16.25	45.05	7.50	7.20	7.40	7.05		
5.....	16.75	16.25	....	7.50	7.20	7.42½	7.07½		
7.....	16.75	16.12½	44.37½	7.50	7.20	7.45	7.10		
8.....	16.75	16.25	43.62½	7.50	7.20	7.42½	7.07½		

\*Refinery quotation; delivered price ¼c. higher.

### New York

NEW YORK, May 8.

Continued inactivity pervades nearly all the markets and lower prices have been registered in most of them.

**Copper.**—The electrolytic copper market continues to sag, largely because of lack of buying by domestic consumers, who appear to be well covered for the next three months. The European situation has also had its effect. There was, late last week, a little more activity manifested in the shape of inquiries from consumers, but only a little buying resulted. As is usual in conditions such as the present, consumers are shy and prices are declining because here and there a seller or two will make lower offerings. Electrolytic copper can be purchased today at 16.50c., delivered, for May delivery and it is likely that in some cases this could be shaded ½c. A fair appraisal of the market in the face of only a little demand is 16.50c., delivered, for May.

**Tin.**—Only moderate activity is reported in the Straits tin market up to and including Friday, May 4. The business done was principally between dealers, although consumers did buy a little more freely than for some weeks. From May 1 to 7 about 400 tons were sold on the New York Metal Exchange and this is conservatively estimated to represent about one-half of the business of the week. Both Saturday and Monday were dull days, but about 200 tons changed hands today, the quotation for spot Straits being 43.62½c., New York. The London market continues to decline and is weak, due to political developments in Europe and to lack of demand here. London quotations today were £206 10s. for both spot and future standard and £211 10s. per ton for spot Straits, all about £9 per ton less than two weeks ago. Arrivals thus far this month have been 2730 tons, with 6624 tons reported afloat. Deliveries into consumption in April were 6775 tons, with 3577 tons in stock and landing on April 30. Imports in April were 6285 tons, bringing the total to May 1 to 26,092 tons.

**Lead.**—The market is exceedingly quiet. Better buying developed last week up to the time of the reduction in quotations by the leading interest on May 3, when its price was reduced to 7.50c., New York. The import situation continues to be the controlling factor and supply of lead is still a little ahead of demand. The general market both for the leading interest and independent sellers is 7.20c. to 7.25c., St. Louis, or 7.50c., New York.

**Zinc.**—There was a revival of interest by consumers in this market last week which caused the price to advance from the recent low levels, but late yesterday and today weakness again developed. Two causes for this are assigned: One was the bearish speech by a London representative at the meeting of the American Zinc Institute in St. Louis yesterday, and the other was the slump in the stock market here the same day. Lower offerings were made today, although demand is very light, prices ranging from 7.05c. to 7.10c., St. Louis, or 7.40c. to 7.45c., New York.

**Nickel.**—Shot and ingot nickel are quoted unchanged at 29c. to 32c., and electrolytic nickel is held at 32c. per lb. by the leading producers. Shot and ingot nickel in the outside spot market are quoted at 29c. to 32c.

**Antimony.**—Chinese metal in wholesale lots for

early delivery is quoted at 7.62½c. per lb., New York, duty paid.

**Aluminum.**—Virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery is quoted by importers of the foreign metal at 26.50c. to 27c. per lb., New York, duty paid. The leading domestic producer is giving out no quotations.

**Old Material.**—Business is quiet and the market is very unsettled, there being quite a difference of ideas as to values. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	16.25
Copper, heavy and wire.....	14.75
Copper, light and bottoms.....	12.75
Heavy machine composition.....	12.75
Brass, heavy.....	9.75
Brass, light.....	7.25
No. 1 red brass or composition turnings..	11.00
No. 1 yellow red brass turnings.....	8.75
Lead, heavy.....	7.00
Lead, tea.....	5.75
Zinc.....	5.25

### Chicago

May 8.—Tin and lead have declined, while zinc has advanced slightly. Copper is unchanged but at the moment appears slightly firmer. Tin has been fluctuating widely from day to day with little consumer buying. The leading lead producer has lowered prices another 25c. a hundred pounds, but independent prices have sunk even lower. Consumption of lead remains heavy despite light buying. Zinc has stiffened and is now about ¾c. above its recent low point, as the result of forced buying by certain important interests which had exhausted their supplies. With consumption heavy and supplies not excessive, further forced buying would cause additional advances. The old metals remain unchanged. We quote, in carload lots, lake copper, 17c.; tin, 46c.; lead, 7.37½c.; spelter, 7.20c.; antimony, 9.50c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 13.50c.; copper bottoms, 11.50c.; red brass, 10.50c.; yellow brass, 7.50c.; lead pipe, 6.00c.; zinc, 4.25c.; pewter, No. 1, 28.50c.; tin foil, 31.50c.; block tin, 37c., all buying prices for less than carload lots.

### Italy's Tariff Concessions to Austria

WASHINGTON, May 8.—Reduction of import duty on pumps, metal and wood furniture, wire, nickel articles and agricultural machinery has been granted by Italy to Austria in a commercial treaty just signed by these two countries, according to a cablegram received by the Department of Commerce from Commercial Attache H. C. MacLean, Rome. Austria has granted a reduction of import duty on Italian agricultural products. Special facilities will be provided for Austrian trade through Trieste.

### Valley Scrap Weak

YOUNGSTOWN, May 8.—In the iron and steel scrap markets, weakening tendencies are still apparent, and there is no rush on the part of melters to accumulate stocks at prevailing levels. The price range on heavy melting in the Youngstown district is from \$25 to \$26, while compressed sheets range from \$24.50 to \$25.

Liquidation of the affairs of the Brier Hill Steel Co., Youngstown, absorbed by the Youngstown Sheet & Tube Co., is proceeding rapidly, says J. B. Kennedy, chairman of the board of directors. Reduction of the stated common capital of the company from \$12,500,000 to \$500 was directed May 5 by stockholders, and the \$5,000,000 issue of preferred stock was ordered cancelled. All of the preferred has either been exchanged for preferred stock of the Sheet & Tube Co. or redeemed at \$105 per share. Very satisfactory operations of the Brier Hill plants are being maintained by the Sheet & Tube Co.



# Minnesota Ore Tax Law Is Declared Valid

Supreme Court Upholds Occupational Levy, Which  
Will Require Large Payments  
to the State

WASHINGTON, May 8.—Speaking through Mr. Justice Van Devanter, the Supreme Court of the United States yesterday in a unanimous opinion declared the Minnesota occupational tax on the valuation of iron ore mined or produced in that State is constitutional. The holding of the Supreme Court affirms the decision of the District Court of the United States for the District of Minnesota. The case was appealed by iron ore mining interests and iron and steel companies owning ore in Minnesota. Among the prominent operators involved in the case were the Oliver Iron Mining Co., the Cleveland-Cliffs Co., the Republic Iron & Steel Co. and the Interstate Iron & Steel Co.

The case has attracted widespread attention not only among ore and iron and steel operators, but throughout the industrial world because it concerned the right of a State to place a tax on production. In this instance the Supreme Court specifically declared that the Minnesota tax was an occupational tax. The tax was provided by an act of the State of Minnesota of April 11, 1921, and imposes 6 per cent on the value of ore mined or produced during the preceding year.

The ore and steel interests brought suit to restrain and prevent the State of Minnesota from enforcing the occupation tax, which required that reports of operations be made each year before Feb. 1, in the absence of which the State Tax Commission is empowered to determine the amount and value of the ore and to compute the tax and assess in addition a penalty of 10 per cent. The companies declined to make reports for 1921 under the claim that the law was invalid and that it conflicted with the constitutional provision that "Taxes shall be uniform upon the same class of subjects."

The Supreme Court, however, said:

"We think the tax in its essence is what the act

calls it—an occupation tax. It is not laid on the land containing the ore, nor on the ore after removal, but on the business of mining the ore, which consists in severing it from its natural bed and bringing it to the surface, where it can become an article of commerce and be utilized in the industrial arts. Mining is a well recognized business wherein capital and labor are extensively employed. This is particularly true in Minnesota. Obviously a tax laid on those who are engaged in that business, and laid on them solely because they are so engaged, as is the case here, is an occupation tax.

"The chief contention is that mining as conducted by the plaintiffs, if not actually a part of interstate commerce, is so closely connected therewith that to tax it is to burden or interfere with such commerce, which a State cannot do consistently with the commerce clause of the Constitution of the United States," added the court, explaining that the mining companies said practically all of their output was used outside the State, and thus went at once into interstate commerce. In 1921, out of a total output of 18,167,370 tons, only 261,622 was sold and used within Minnesota.

"Plainly the facts do not support the contention," said the opinion. "Mining is not interstate commerce, but, like manufacturing, is a local business subject to local regulation and taxation. Its character in this regard is intrinsic, is not affected by the intended use or disposal of the product, is not controlled by contractual engagements, and persists even where the business is conducted in close relation to interstate commerce. The business on which the tax is laid ends before the ore enters interstate commerce, and there is no discrimination against such commerce. It may well be that the tax indirectly and incidentally affects that commerce, just as any taxation of railroad and telegraph lines does, but this is not a forbidden burden or interference."

## Mining Companies Will Pay Millions to State

DULUTH, May 8.—The state occupational tax deducts from the worth of ore as mined the mining and development costs, including stripping and underground developments and taxes, all apportioned on total tonnages for each mine, also royalties. The law then levies 6 per cent on the remainder, which latter is assumed to be net profits. Figuring carefully all iron ores, of all classes and all districts in the State, their worth at the mouth of the mine and all reducing factors allowed by law, the result indicates a probable tax payment for 1921 amounting to about \$2,000,000, this providing all ore mined that year is included. The law became effective April 21, 1921. For 1922, the tax to be paid probably amounts to about \$2,600,000 on a return less per ton than the previous year. For 1923 one must make a general assumption for production of the year. Putting this at 45,000,000 tons from the State, the occupational tax receipts for the year will be approximately \$4,000,000. While ore prices are higher than last year, wages, supplies and lake freights are up nearly enough to offset the higher price.

State officials are quoted as estimating receipts for the past two years as probably \$5,500,000 but \$4,600,000 seems far nearer a reasonable probability.

Roughly speaking, considering all classes in Minnesota districts, the profits per ton were approximately \$2 in 1921 and \$1.50 the following year. They will probably be less the present season than in 1921 and approximate 1922. All the above estimates assume no possibility of intercompany business, but that all ores are worth approximately such prices as indicated by merchant open market sales.

### Detroit Scrap Market

DETROIT, May 8.—Scrap melting schedules in this district continue at the high tonnage rate established during the first quarter of the year. Prices on old material are virtually the same as quoted a week ago.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel.....	\$21.50 to \$22.50
Shoveling steel .....	23.50 to 24.50
No. 1 machinery cast .....	26.00 to 27.50
Cast borings .....	16.75 to 17.75
Automobile cast scrap.....	27.50 to 29.00
Stove plate .....	19.50 to 21.00
Hydraulic compressed .....	19.75 to 20.75
Turnings .....	16.00 to 17.00
Flashings .....	17.25 to 18.25

## PERSONAL

Rogers, Brown & Co. announce the appointment of Frank E. Fitts as joint manager with H. W. Fernald of the Boston office of the firm. Mr. Fernald has long been manager of that office and Mr. Fitts was connected with it until transferred to the New York office last year.

Noah W. Elliott has been elected president of the Elliott-Blair Steel Co., New Castle, Pa., succeeding George D. Blair, who sold his interest in the company and retired from it April 30. Mr. Elliott has been engaged in the iron and steel business for more than 40 years, chiefly in the manufacture of cold-rolled strip steel. In 1893 he and his associates established a plant in New Castle for rolling cold-rolled strip steel and the business has continued to the present time under his management. The business was incorporated in 1917. There are now associated with Mr. Elliott his brother, Thomas C. Elliott, who is vice-president of the company, and two sons, Reuben J. and Elmer L. Elliott, secretary and general manager, respectively. The business has increased so rapidly in recent years that an additional plant was acquired at Mercer, Pa. Both plants are operated from the general office at New Castle. In addition to his duties as president, Mr. Elliott will be treasurer.



N. W. ELLIOTT

F. Archer Thompson, for several years in the manufacturing and service departments of the Bullard Machine Tool Co., Bridgeport, Conn., and recently chief of the equipment department, has been appointed to represent the Bullard company in Detroit in a sales and engineering capacity. He is located with the Motch & Merryweather Machinery Co., Majestic Building, official representatives of the company for Detroit.

W. W. Rinehart, manager of purchasing departments of the Pennsylvania Tank Car Co. and the Petroleum Iron Works Co., Sharon, Pa., has resigned to become manufacturers' representative for several lines including malleable castings, cement, paint and packing. He was with the Petroleum company 11 years. J. T. O'Connor, who has been in the company's purchasing department in the Pittsburgh district, succeeds him. Mr. Rinehart will have offices in the First National Bank Building, Sharon.

Charles M. Mersereau, for the past 10 years identified with the Bayne Co., Inc., 29 Sullivan Street, New York, has resigned to join the sales force of Van Vechten & Son, 18 Warren Street, New York.

Harold H. Perry, manager's assistant, Industrial Works, Bay City, Mich., sailed for England on April 28. He will study locomotive and wrecking cranes as used in that country.

C. O. Sternagle, formerly with the American Bridge Co., Pittsburgh, for 11 years, and for the past 10 years with the Colonial Steel Co., seven years as branch manager in Chicago, has severed his connection with the latter company to engage in business for himself.

George T. Aitken, Buffalo, at one time Buffalo manager for the Syracuse Supply Co. and later Western New York representative for the Becker-Blaisdell-Reed-Prentice organization, has become a member of the firm of D. R. Clarkson & Co., Inc., Rochester, N. Y., machine tool dealers, and will have charge of their Buffalo office as manager.

C. A. Rose, formerly identified with Guggenheim Brothers, has been appointed general manager of the British American Nickel Corporation, Ltd., with offices at Ottawa, Canada.

Thomas O'Brien, who has been connected with the John F. Allen Co., New York, as engineer and sales manager for the past 12 years, has been made general manager.

L. Weimer Murray, sales manager General Refractories Co., Chicago, has associated with him P. C. Leonard and G. S. Kennelley, both of whom were formerly connected with the American Refractories Co., which has been acquired by the General Refractories Co. The Chicago office is located at 208 South LaSalle Street.

W. D. Creider, for the past eight months in charge of the Milwaukee office of the Federal Machinery Sales Co., Chicago, became sales manager, effective May 1, of the Oil-Gear Co., Milwaukee.

E. J. Skinner has been made president of the Skinner Chuck Co., New Britain, Conn., to succeed the late Charles Glover. Paul K. Rogers becomes vice-president, and James P. Rogers and F. S. Chamberlain have been added to the board of directors. A. A. North, superintendent, is vice-president in charge of production.

Harry W. Goddard, chairman of directors of the Wickwire Spencer Steel Corporation, sailed last Saturday for a three months' tour of Europe. His trip is primarily for rest, but incidentally to study conditions.

Frank M. Sterrett, for many years plate salesman with the Midvale Steel & Ordnance Co. in its New York sales office, has become manager in the New York district for Brown & Co., Pittsburgh, manufacturers of staybolt iron.

C. G. Lisch has been appointed manager of the Cleveland sales office, 730 Engineers Building, of Young Brothers Co., Detroit, manufacturer of industrial ovens. He was formerly in charge of the Chicago office of that company.

Graeme Ross has been appointed manager of the Kansas City office, Westinghouse Electric & Mfg. Co., to succeed F. F. Rossman, resigned to become vice-president of the Mobile Light & Railway Co., Mobile, Ala. Other changes include: E. L. Doty, formerly service manager, Buffalo office, as engineering assistant, service department, with headquarters at East Pittsburgh; C. W. Jones as general foreman, controller department, East Pittsburgh; C. A. Fike as general foreman, coils and insulation department, East Pittsburgh; J. H. Hartman as general foreman, store department, East Pittsburgh; W. S. Oswald as general foreman, railroad motor department, East Pittsburgh.

J. M. Morris, assistant traffic manager of the National Tube Co., Pittsburgh, has been promoted to traffic manager, succeeding the late J. Fred Townsend.

Banks Hudson, manager for several years at the Princess furnace in Virginia, has been appointed general manager for the Joseph E. Thropp Co., Inc., with headquarters at Everett, Pa. He will have charge of operations at the Everett and Saxton blast furnaces, and of the mines, coke ovens, quarries, etc., located in Bedford County, Pa.

F. W. Shaw has been appointed representative of the industrial chain division of the Columbus McKinnon Chain Co. in Michigan, Ohio, Indiana and Kentucky, with headquarters at Cleveland. He has been with the Bethlehem Steel Co. during the last five and one-half years, working from the Cleveland office. Prior to this he was with the DeLaval Steam Turbine Co., Trenton, N. J., and the Ingersoll-Rand Co., Phillipsburg, N. J.

Charles Champlain, Pittsburgh, has been appointed manager of the Sharon, Pa., plant of the Westinghouse Electric & Mfg. Co., manufacturing transformers.

George H. Boyd has been elected chairman of



directors of the Valley Mold & Iron Corporation, Sharpsville, Pa. Henry Lockhart, Jr., New York, was elected vice-president; Julian W. Gault, secretary; Robert S. Crawford, Cleveland, treasurer; Francis W. King, assistant treasurer, and C. M. Allabach, assistant secretary. John E. Perry was reelected president.

Harry R. Mercer has been appointed assistant superintendent of the McDonald Works, Carnegie Steel Co., at McDonald, Ohio, a six-unit bar plant. He was previously roll designer.

Walter E. Meub, secretary, Youngstown Sheet & Tube Co., Youngstown, Ohio, has returned to his desk following a business trip to Florida and other points in the South.

M. W. Zeman, engineer and sales manager for the molding machine division of the Osborn Mfg. Co., Cleveland, will sail for Europe from New York on Tuesday, May 15, on the Berengaria. He will be absent a number of months.

Prof. L. P. Breckenridge will address the New Haven section of the American Society of Mechanical Engineers on May 21 on the past and future of engineering.

Jacob D. Waddell has resigned as president of the Mahoning Valley Steel Co., Niles, Ohio, but will continue as a stockholder and director. J. P. Hosack, vice-president, will be in charge of the company temporarily. Mr. Waddell was formerly general sales manager of the Brier Hill Steel Co., Youngstown, and helped organize the Mahoning Valley Steel Co. in 1916.

Ralph B. Rose, assistant general agent in charge of the bureau of bars and hoops, order and shipping department, Carnegie Steel Co., has resigned on account of ill health. Mr. Rose has been with Carnegie Steel Co. for 22 years and previously for a number of years had been with Carbon Steel Co. He is retiring from active business for the purpose of building up his health. His successor is Allen B. Carson.

## OBITUARY

WILLIAM J. GAMBLE, treasurer and general manager of the Vulcan Steam Forging Co., Buffalo, died at his home, 1048 Elmwood Avenue, that city, on May 2. He was formerly an official of the Iroquois Iron Works of Buffalo. Mr. Gamble was born in Rochester, N. Y., but came to Buffalo when a young man, and has long been identified with the iron trade and forging business. He is survived by his widow, two sons and two daughters.

CHARLES E. KEENAN, for many years railroad specialty salesman with the Midvale Steel & Ordnance Co., who became New York representative for Brown & Co., Pittsburgh, at the time of the recent merger of Midvale with the Bethlehem Steel Co., died last week of gangrene poisoning. Mr. Keenan had been with the Midvale company since it took over the Worth Brothers' steel plant at Coatesville, Pa., and had been with Worth Brothers for many years. His home was at West New York, N. J. The death of Mrs. Keenan preceded that of her husband by just six weeks.

CHARLES E. SHELDON, chairman of the board of directors of the Whitman & Barnes Mfg. Co., Akron, Ohio, died at his home in that city on April 30. He was born at Fitchburg, Mass., April 14, 1850. In 1867 he became connected with the Whitman & Miles Mfg. Co., Fitchburg, manufacturer of mower and reaper knives and guards. A consolidation was made with other plants and the name changed to Whitman & Barnes Mfg. Co. In 1872 Mr. Sheldon was made superintendent of the Fitchburg works, and in 1877 he went to Akron to take charge of the works there, being associated at that time with Col. A. L. Conger and

L. C. Alden. In 1889 he was made treasurer and later vice-president and general manager. For a number of years the company maintained a plant in the Chicago district which manufactured agricultural tools, and in other ways its activities were broadened under Mr. Sheldon's administration. He was president of the company from 1902 to 1915, when he retired and was elected chairman of the board of directors. Mr. Sheldon was one of a number of men of New England training who migrated to the Central West and contributed in an important way to its development industrially.

DANIEL N. BATES, Worcester, Mass., for 35 years traffic manager of the Washburn & Moen Mfg. Co., and its successor, the American Steel & Wire Co., in the Worcester district, died in Worcester on May 2, aged 69 years. He was born in Boston. His early business life was devoted to transportation with railroad and steamship companies. In 1883 he was made New England agent for large railroad interests, which position he held until he went with Washburn & Moen. He retired from active work in 1921.

SCOTT RUSSELL HAYES, vice-president New York Air Brake Co., and youngest son of the late Rutherford B. Hayes, former President of the United States, died on May 6 at the Ossining Hospital, Ossining, N. Y. He was born at Columbus, Ohio, in 1871. Prior to his connection with the air brake company, he was with the Railroad Springs Co., New York.

HENRY CHANNON, founder, and for many years president, H. Channon & Co., Chicago, manufacturers and distributors of mill supplies, died at his winter home in Winter Park, Fla., May 5, at the age of 89. He was born in 1834 at Bridgewater, England, and left his home at an early age to follow the sea. He went to Chicago in 1863 and started a small shipchandlery. After losing everything in the Chicago fire in 1875, he founded H. Channon & Co., continuing as president until 1919, when he sold his interests.

PAUL KREUZPOINTNER, publicist, educator and scientist, for many years prominent in iron and steel testing and specification work, died suddenly at his home at Altoona, Pa., on May 7. He was born in Germany in 1842 and came to the United States in 1866. He was one of the country's well-known metallurgists and had written extensively for scientific publications. He had made a study of the apprenticeship system, particularly connecting modern developments along this line with the early guild systems of Europe. He learned a mechanical trade in Germany and in later years made a thorough study of industrial and scientific educational courses in Germany and the United States. For many years he took an active part in the work of the American Foundrymen's Association and frequently contributed to its proceedings. For 30 years he was head of the Pennsylvania Railroad's testing department at Altoona. He was a member of the American Society for Testing Materials and the National Manufacturers' Association.

Within one week after the fire which completely destroyed the buildings of the United Steel & Wire Co., Battle Creek, Mich., on March 9, work was resumed in temporary quarters, and by April 14 two new brick and steel buildings were erected and ready for occupancy. Machinery was replaced during that time to the extent of 80 per cent. It is expected that normal production will be reached soon. Additional buildings will be erected in the near future, including a new administration building and a large factory annex.

Work is suspended in the iron mines at Bell Island, Newfoundland, 1600 men having been paid off, as there is no ready market for the ore. The last shipment of 6500 tons left for Germany Jan. 12, completing an output of 750,000. Shipments to the United States used to be about 300,000 tons annually, but now there is none shipped here.

## British Iron and Steel Market

Steel Prices Weakening—Tin Plate Lower—  
Coke Prices Higher—Continental  
Competition Heavier

(By Cable)

LONDON, ENGLAND, May 8.

Pig iron is dull with prices unchanged but tendency weak. Hematite is quiet and unchanged. Thornaby has blown in two furnaces.

Foreign ore is stagnant. Sellers of Bilbao Rubio ask 24s. (\$5.54) ex-ship Tees.

Finished steel generally is quiet. Most makers are reluctant to grant concessions, but firm offers generally are accepted. The tone is weaker. Ebbw Vale Steel, Iron & Coal Co., Ltd., is restarting.

The London & Northeastern Railroad is placing orders for 78 locomotives, 280 passenger coaches and 10,000 odd goods wagons (freight cars).

Armstrong, Whitworth & Co., Ltd., has launched an 8000-ton oil tanker.

Continental competition is increasing, but buyers are reluctant to negotiate. Belgium has booked some orders for wire rods and is sold out to the end of June. Makers are quoting for July £11 10s. (\$53.13), f.o.b.

The German government has agreed to recognize French and Belgian license indorsements on contracts with foreign firms placed prior to Feb. 20; and to permit Ruhr firms to receive or deliver such goods if foreign firms apply to the occupation authorities. But direct cooperation of German with French authorities is forbidden; approval of the Reichskommissar is first essential. Several barges already have reached Rotterdam.

Tin plate is easy on second sales. Domestic and export demand is quiet, but makers are well placed.

Galvanized sheets and black sheets are quiet and prices are unchanged.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at \$4.62 per £1, as follows:

Durham coke, delivered	£2 4s.			\$10.16
Cleveland No. 1 foundry	6 10			30.03
Cleveland No. 3 foundry	6 5			28.87
Cleveland No. 4 foundry	6 0			27.72
Cleveland No. 4 forge..	5 17½			27.14
Cleveland basic .....	6 0			27.72
East Coast mixed.....	6 2½			28.30
Ferromanganese .....	18 0			83.16
Ferromanganese* .....	20 0			92.40
Rails, 60 lb. and up....	10 0	to £10 10s.		46.20 to \$48.51
Billets .....	9 10	to 10 0		43.89 to 46.20
Sheet and tin plate bars,				
Welsh .....	10 0			46.20
Tin plates, base box...	1 4	to 1 4¾		5.54 to 5.71
				C. per Lb.
Ship plates .....	10 0	to 10 10		2.06 to 2.16
Boiler plates .....	12 10	to 13 0		2.58 to 2.68
Tees .....	10 15	to 11 5		2.22 to 2.32
Channels .....	10 0	to 10 10		2.06 to 2.16
Beams .....	9 15	to 10 5		2.01 to 2.11
Round bars, ¾ to 3 in.	11 0	to 11 10		2.27 to 2.37
Galvanized sheets, 24 g.	19 10	to 20 0		4.02 to 4.12
Black sheets, 24 gage..	14 10	to 14 15		2.99 to 3.04
Black sheets, Japanese				
specifications .....	15 5			3.14
Steel hoops .....	11 0	& 13 0*		2.27 & 2.68*
Cold rolled steel strip,				
20 g. ....	23 0			4.74
Cotton ties, Indian speci-				
fications .....	15 0			3.09

\*Export price.

### Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

Billets:				
Belgium, May, June..	£7 0s.	to £8 0s.		\$32.34 to \$36.96
Merchant bars:				
Belgium, May, June..	8 10	to 8 15		1.75 to 1.80
Luxemb'g, May, June	8 12½	to 8 15		1.78 to 1.80
Joists (beams):				
Belgium, May, June..	8 12½	to 8 15		1.78 to 1.80
Luxemburg .....	8 10	to 8 12½		1.75 to 1.78
½-In. plates:				
Belgium, May, June..	9 0			1.86

## APRIL STEEL OUTPUT

Exceeds March in Daily Rate—Total for the  
Whole Industry About 48,500,000 Tons  
Per Year

While the total ingot production of the thirty steel companies reporting to the American Iron and Steel Institute for April was less than for March, the daily rate was higher. The April returns show these companies to have produced 3,321,275 gross tons or 132,551 tons per day for the 25 days of April. The March figures were 3,402,007 tons, or 126,000 tons per day. Thus, the increase in April over March was 6851 tons per day.

For the first time this year a new factor is introduced into the calculations for the steel industry as a whole, since the institute now gives it out that the thirty reporting companies made 84.13 per cent of the total ingot output in 1922. On this basis the production of the entire country in April was about 3,947,800 tons, or 157,900 tons per day. This would mean that the April production was at the rate of about 49,110,000 tons.. It is probable, however, that the ratio of 84 per cent does not now prevail and it is more likely that the April production was at a rate of 48,000,000 to 48,500,000 tons per year, or about 92 per cent of capacity.

The statement made this week by the institute that the thirty companies made 84.13 per cent of the total in 1922 indicates that the total ingot output last year was 34,608,880 tons, the thirty companies having made 29,116,453 tons.

The statistics of the American Iron and Steel Institute since January, 1921, follow in gross tons:

Monthly Production of Steel Ingots by 30 Companies Which  
Produced About 84.13 Per Cent of the Steel  
Ingot Production in 1922

Months	Open-Hearth	Bessemer	All Other	Total
January, 1921...	1,591,281	608,276	3,629	2,203,186
February .....	1,295,863	450,818	2,796	1,749,477
March .....	1,175,591	392,983	2,404	1,570,978
April .....	1,000,053	211,755	2,150	1,213,958
May .....	1,047,810	216,497	1,543	1,265,850
June .....	808,286	193,644	1,476	1,003,406
July .....	689,489	113,312	575	803,376
August .....	915,334	221,116	1,621	1,138,071
September .....	908,381	265,152	1,207	1,174,740
October .....	1,269,945	345,837	1,028	1,616,810
November .....	1,294,371	363,912	1,718	1,660,001
December .....	1,129,174	296,380	1,539	1,427,093
Total, whole yr.	13,125,578	3,679,682	21,686	16,826,946
January, 1922...	1,260,809	331,851	822	1,593,482
February .....	1,395,835	348,571	616	1,745,022
March .....	1,918,570	451,386	795	2,370,751
April .....	1,997,465	445,939	1,109	2,444,513
May .....	2,214,774	494,893	1,474	2,711,141
June .....	2,143,708	487,851	2,918	2,634,477
July .....	2,020,572	464,047	2,485	2,487,104
August .....	1,807,310	404,379	2,893	2,214,582
September .....	1,911,147	460,127	2,505	2,373,779
October .....	2,352,207	518,010	2,198	2,872,415
November .....	2,360,903	525,945	2,449	2,889,297
December .....	2,241,104	536,214	2,572	2,779,890
Total, whole yr.	23,624,404	5,469,213	22,836	29,116,453
January, 1923...	2,571,491	677,486	2,717	3,251,694
February .....	2,290,418	625,838	2,761	2,919,017
March .....	2,656,134	742,564	3,309	3,402,007
April .....	2,594,706	722,719	3,853	3,321,278

J. Carson Agnew, formerly assistant to the president of the Midvale Steel & Ordnance Co., in charge of raw materials and pig iron sales, and his associate, R. L. Batteiger, announce the incorporation of Agnew, Batteiger & Co. to engage in business as merchants in coal, coke, ores, alloys, fluxes, pig iron, scrap and kindred materials, with offices in the Widener Building, Philadelphia, the same suite they occupied while with the Midvale company.

The George J. Hagan Co., Pittsburgh, has moved its offices from the Peoples Bank Building, Pittsburgh, to the Chamber of Commerce Building, that city.



### Excessive Caution Declared Not Desirable (Concluded from page 1345)

Secretary had sought, the work along these lines probably will be restricted, but nevertheless it is hoped to develop constructive results. The work will be entirely new to the Department of Commerce.

Although the original organic act of the department contemplated a bureau for certain services in the matter of domestic commerce, there never before has been a provision for work of this kind. Secretary Hoover expressed the opinion that the greatest fault and deficiency in the economic fabric of the Nation lies not in problems of production so much as it lies in problems of distribution. He stated that the examination of railroad rates from the point of view of their economic effect on distribution and the manner in which they affect, for instance, agriculture, as distin-

guished from manufactures of high-class goods, is not adequately done anywhere in the Government.

Another study of the new division will cover retail distribution and also it will look to the intensification of the work determining specifications of various kinds of goods, largely to be developed through cooperative efforts in the trades themselves, the grading of commodities and the establishment of security to the public as to the quality of goods.

Other questions to be studied will deal with arbitration of commercial disputes, the purpose being to get various trade associations to adopt arbitration agreements, all tending to ameliorate costs. It will be a question of settlement of disputes on delivery and qualities of goods and matters of similar character as they affect distribution. It will not pertain to work of conciliation in the labor field, the latter being under the jurisdiction of the Department of Labor.

## Secretary Hoover Speaks on Holding on to Prosperity

HERBERT HOOVER, Secretary of Commerce, discussed the economic measures needed for "holding on to prosperity" in an address by that name delivered in New York May 8 before the United States Chamber of Commerce.

Dealing with the present situation, Secretary Hoover praised caution, stressed the need for confidence and courage as well, and marked emphatically the difference between caution and timidity. He stated that there is no comparison of the present situation with 1920. This is prosperity and can be preserved; that was a wasteful boom. Mr. Hoover outlined the essential economic differences between the two periods. To understand our economic position and take advantage of it, he said, "we must get our minds away from the notion that pre-war standards of living and volume of business would be normal now."

The broader and deeper essentials involved in the planning of commerce and industry to keep the nation permanently prosperous constituted the major theme of the address. Great shifts in the economic stream in the United States, the Secretary held, have made necessary the realization of new forces to be met and conditions to which we must accommodate our industry and commerce.

He cited the increase in efficiency of production of from 10 to 15 per cent per capita since the period immediately preceding the war as one important phase of the necessity for new standards of business thought. A selection of industries furnishing commodities raising the plane of the average citizen's comfort and convenience of life in the past decade shows a growth of 60 per cent. "We could today supply each person the same amount of commodities that he consumed ten years ago," Mr. Hoover said, "and lay off about 2,000,000 people from work." The increased spread in the consumption of conveniences and comforts, he maintained, is desirable and does not represent extravagance, but progress.

The strategy of business in the method of handling our vast gold reserves so as to make for safety against inflation, the tremendous need for increased private construction throughout the country and the relief to be given to private construction by the retardation of public works, the need of a policy in agricultural exports which will accommodate our farmers to the European situation, the need for further growth in efficiency in production and distribution in order that by continued lowering of costs we can replace agricultural exports with manufactured exports, the effect that shortage of transportation, intermittent character of the coal industry and other large commercial problems have upon our future production costs, were all discussed.

Examples were given of the work by the Department of Commerce in simplification of practices and elimination of waste in industries through cooperation with the industries themselves. "I have recently received a statement from one single group," Secretary

Hoover said, "estimating that the savings in production cost in that trade already exceed \$25,000,000 per annum." Requests to the Department of Commerce for business assistance, advice, and information have risen in 18 months from a few hundred daily to more than 3000 daily.

Government has a definite relationship to the advance and maintenance of prosperity, "not as an agency for production and distribution of commodities, nor as an economic dictator, but as the greatest contributor in the determination of fact and of cooperation with industry and commerce in the solution of its problems."

The preservation of initiative and the safeguarding of the rewards of individual effort, character and ability are keystones, the Secretary said, which must be preserved, "for when all is said and done the finer flowers of civilization do not grow from the cellars of poverty any more than they grow from the palaces of extravagance. They grow from the bettering comfort and well-being of the whole of great peoples."

### Niagara Power for New England

Of much significance to the industries of New England is an arrangement made between the Adirondack Power Co. of New York and the New England Power Co., by which the power from Niagara Falls will be delivered to New England. The New England Power Co. develops large hydraulic units on the Connecticut River and its tributaries, and at present is distributing 115,000 kw., chiefly for manufacturing purposes. Its lines are tied up with the big central steam power stations in Boston, Providence, Worcester and other centers, so that in time of low water its customers may be supplied without interruption. Transmission lines are building connecting the Adirondack system with the New England system on the east and the Niagara system on the west, and delivery of power is promised in 1924. The contract for New England provides for 15,000 kw. immediately upon connecting up the lines, with an option for still another 15,000 kw. when demands make it necessary.

### Jones & Laughlin Gets Clear Title

The East Chicago Land Co. on May 4, presented to the State auditor of Indiana a bid of \$375 an acre, or a total of \$119,625, for 319 acres of State land in Lake County which are desired as a site for a plant for the Jones & Laughlin Steel Corporation. The bid was the only one received and was accepted. The land is a portion of a large tract sold to the Jones & Laughlin company by the East Chicago company a year or two ago. Subsequent to the sale, however, the State of Indiana claimed title to the 319 acres, which now have finally been acquired from it by the East Chicago company.

### An Opportunity in Machinery Export

(Concluded from page 1348)

would appear that our machinery manufacturers have an interest in about 1500 students from 80 foreign countries and in 94 colleges. Those registered may be classified as follows:

Chemical engineering .....	84
Civil engineering .....	156
Electrical engineering .....	147
General engineering .....	
(Freshmen and Sophomores) .....	553
Mechanical engineering .....	200
Mining engineering .....	127
Textile engineering .....	7

1,274

Experience abroad suggests that we are not doing our best by these young men. On their return to their several home countries there are too many square plugs in round holes—misfits. This problem will be obvious to those having experience as employers and educators, but the unfortunate thing appears to be that the preventive measures commonly taken in industry are not yet applied to these students, which is after all a serious matter, as the investment involved is probably not less than \$5,000 per student.

The problem heretofore outlined is not new but has long been recognized by missionaries, business men, officials, educators and many others and there are at least 15 different organizations that, in one way or

another, have made an effort to assist foreign students. But one result of having so many organizations at work perhaps tends toward a diffusion rather than a concentration of effort. Also, the business community does not appear to have cooperated adequately.

In the above, in stating the shortcomings of the engineering or commercial student on his return home, it might have been added that often he is found to be bookish and deficient in practical matters. He needs far more serious shirt-sleeve training than he gets while here. On graduating, the American student frequently finds himself in a difficult position in trying to make a start in life. Obviously the foreign student is in a still worse position, for a great variety of reasons, and Americans who would like to help are often unable to do so, for lack of organization.

Consideration of this whole problem leads to the conclusions that the different organizations now cooperating with these foreign students should consider the desirability of forming a federated association, in order to unify present efforts, and the manufacturers' and business men's associations should consider joining this federation in order to give a purely practical bent to these efforts and to insure that the interests of our foreign trade are adequately represented. It is in this connection that our machinery manufacturer will find a definite opportunity to promote his interests abroad.

## Development in Flexible Joint Cast Iron Pipe

### Taylor Joint Designed to Prevent Seepage—Integrally Cast Lugs a Feature

BY WM. G. HAMMERSTROM\*

THE flexible joint type of cast iron pipe differs mainly from the ordinary bell and spigot and flanged types, in that, as the name implies, the joint permits of a certain number of degrees deflection without injury or leakage. The amount of the deflection varies with the size of the pipe, the average being per-

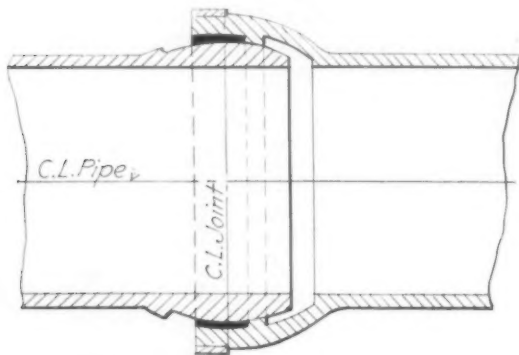


Fig. 1—Section Through Ward Joint

haps about 10 deg.; it is limited by the diameter of the spherical spigot.

The flexible joint type of cast iron pipe is used extensively in pipe lines laid under rivers or in crossing swampy places where great settlement of the bottom is likely to occur. It can also be used advantageously in other cases where the rigid joints of the bell and spigot and flanged pipe would not be suitable on account of the non-flexible feature of the joints.

The first line of flexible joint pipe on record, it is said, was laid upon the bed of the River Clyde into Glasgow in 1810, and the pipe was designed by James Watt, the inventor of the steam engine. Since then a great number of such lines have been laid on the continent, and in this country the most notable one is perhaps the 36-in. line underneath the narrows from Brooklyn to Staten Island, in connection with the New York Catskill water supply. Another line, 24 in. in

diameter, crossing Lake Champlain is worthy of mention on account of its length, namely, 15,000 ft. A more recent one is a 30-in. line laid at a depth of 60 ft. underneath the Elizabeth River at Norfolk, Va.

The joint most extensively used and best known is perhaps the Ward joint, so named after its inventor, James Ward of Philipsburg, N. J. His invention was patented in 1862. A number of flexible joints have been brought out since Ward first successfully used his invention. The greater part of these have been modifications and improvements of the original idea of Ward's. A sectional view of a somewhat modified Ward joint is shown in Fig. 1. The spigot end of the pipe is carefully machined spherically to gage. The integrally cast ring or lead stop in the bell is also machined to a radius corresponding to the diameter of the spigot. This ring serves a three-fold purpose: It centers the spigot of one pipe with the bell of the other, thus allowing a uniform lead space in laying the line; it provides a stop for the lead and limits to an exact dimension the distance the spigot protrudes into the

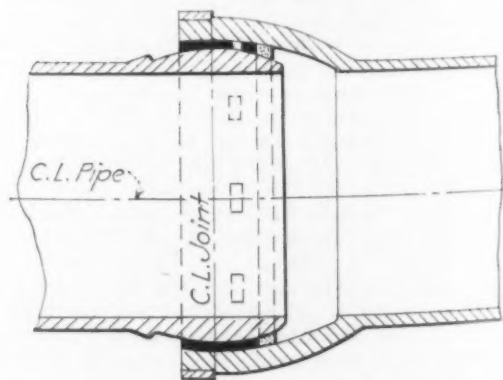


Fig. 2—Section Through Taylor Joint

bell, thus providing a solid bearing in the deflection. In joining two joints when laying, the pipes are usually placed at about 45 deg. on a cradle, and the spigot end of one lowered into the bell of the other. The

\*Chief Engineer, Lynchburg Foundry Co., Lynchburg, Va.



space then produced between the outside diameter of the spigot and the inside diameter of the bell is filled with molten lead which, after cooling, is calked at the face of the bell. The joint is then broken by holding the lower pipe rigid while the upper is slightly deflected. The steel band is shrunk on the outside diameter of the bell to protect breakage of the pipe in handling, in transportation and in laying.

As has already been mentioned, this type of pipe

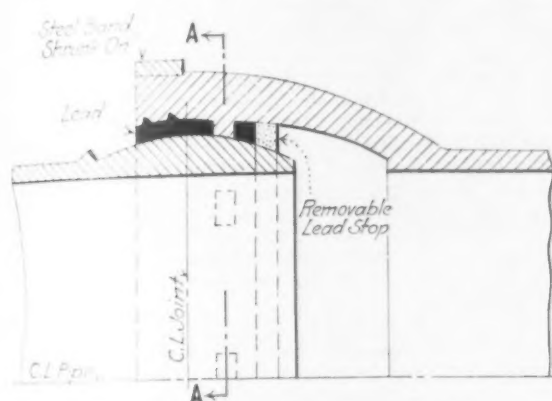


Fig. 3—Longitudinal Section Through a Taylor Joint

has been successfully used in a number of installations with an almost negligible leakage. The fact, however, that the cast iron spigot moves somewhat freely against the lead in the bell in deflecting would suggest a clearance between the two surfaces. This clearance is, of course, infinitely small and through which a leakage or seepage can occur at higher pressures. To prevent this possible seepage and insure, if possible, a joint 100 per cent tight, the Taylor joint has been developed, so-called after its inventor, Walter H. Taylor, Norfolk, Va.

A sectional view of the joint is shown in Fig. 2. The primary feature of this lies in the fact that the lead can be calked after the pipe has been laid, and taken its permanent position at the bottom of the river, and thus insure against the possibility of any leakage that might have been created in the deflection of the pipe while laying.

By comparing the sectional views of the two joints it will be noted that, instead of the lead ring being cast circumferentially, integrally cast lugs are provided, serving the same main purpose as the ring, but permitting the lead to surround the lugs and stop against a removable lead stop. Enlarged views of the Taylor joint indicating the lugs, lead and position of the lead

stop are shown in Figs. 3 and 4. These lugs are of course machined in a similar manner to the solid ring of the Ward joint and to a radius corresponding with the diameter of the spigot. The lower corners of the lugs are rounded off to permit the lead to flow freely around.

In making a joint, the machined spigot end of the pipe is lowered into the bell end of the next until the former rests against the lugs. The removable lead stop is then inserted into place from the inside of the pipe, after which lead is poured into the lead space. It is, of course, of importance that the lead stop be made to some suitable dimension so that, in forcing it into place, it does not go too close to the lugs. The inside of the bell where the lead stop is located is made on a slight taper to allow the stop a strong frictional grip; the inside diameter being forced against the spigot of the pipe. After the lead has solidified, the outer edge of the lead is calked as usual, and the joint broken preparatory to lowering the pipe in place. The lead stop is now removed and, after the pipe has been lowered and taken its permanent position on the bottom of the river, the inner surface is then calked from the inside of the pipe.

The calking can, of course, be accomplished either by hand or by a pneumatic hammer. To permit this calking to be done unhampered, a clearance is provided on the inside of the bell for free handling of chisel and hammer. In addition to the usual double

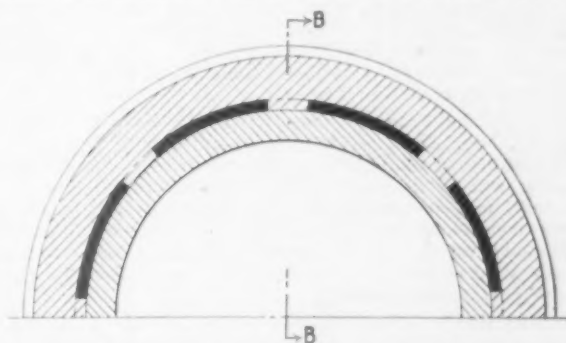


Fig. 4—Transverse Section Through a Taylor Joint

lead grooves at the face of the bell, a third groove is provided near the lower edge of the lead. In the Taylor joint it is also possible to obtain a considerably larger lead space or bearing surface than in the Ward joint, and the lugs also serve to hold the lead in a rigid position. This type can be used only in the larger sizes of pipe which permit a man to enter for calking the inside edge of the lead.

## HOW STEEL HELPED

Story of the Winning of the War Told by  
Grosvenor B. Clarkson

The story of how the World War was won with the help of the great industries of America, particularly iron and steel, is told in a book to be issued this week, of which the author is Grosvenor B. Clarkson, who was a director of the United States Council of National Defense, on "Industrial America in the World War".

"The World War was moved and fought on steel," the author remarks, and a long picturesque chapter rewrites how "business-as-usual" met its first set-back in the steel problem. He tells how for months the War Industries Board, the Fuel Administration, the Railway Administration and captains of the steel industry sought the solution to the problem of meeting an unlimited demand with a limited supply. Mr. Clarkson describes a meeting of the War Industries Board at a time of great uncertainty, Robert S. Lovett, chairman Union Pacific Railroad, presiding, and Judge Gary leading the representatives of the steel industry. Mr. Clarkson gives a complete résumé of the evolution of industrial mobilization under the direction of the Council of National Defense.

"It is certain," said Georges Clemenceau in the

foreword, "that none of the victorious armies could have conquered but for the support of its industries. It is no less clear that no European industry could have survived but for the support of American industry. Germany, which, living for the war, understood its requirements better than we did, had to pay dearly for unpreparedness. In the first quarter of 1915 she passed through a munitions crisis which was not far from being fatal. America, despite the power of her production, only escaped the danger by the magnificent effort of which Mr. Clarkson tells the story. As he rightly says, America was the 'last reservoir'."

M. Clemenceau states that in 18 months this country sent the allies about 5,000,000 tons of food and as much war material. He said that steel enough was sent for 160,000,000 "75s". "Mr. Clarkson," he comments, "is right: the men who won the war behind the lines—on which victory at the front depended—are entitled to the gratitude of the nations, and the nations do not even know their names. It is time justice should be done these men, and this book hastens that day."

Nitrate, the base of nearly every high explosive, was a cardinal feature for the American industrial soldiers, Mr. Clarkson recalls, declaring that the destruction of a single nitrate carrier from Chile was a greater loss than the sinking of a large battleship.

### Plans of New Companies

The Sanitary Septic Tank Corporation, 250 West Fifty-seventh Street, New York, has been incorporated with capital stock of \$100,000 to act as the sales division of the Sanitary Engineering Corporation, same address, manufacturer of tanks and sewerage disposal equipment. The new company will do no manufacturing itself. The incorporators are: L. M. Hackenberg, H. May and I. Gutman.

The Wanner Malleable Castings Co., recently formed to acquire the assets of the Wanner Malleable Iron Co. of Indiana, organized in 1914 with capital of \$75,000, has sold 50,000 shares of class A convertible common stock, no par value, part of which has been used to purchase a foundry at South Beloit, Ill., fully equipped for operation. Another plant is located at Hammond, Ind. Present capacity is about 130 tons of finished castings per day. H. J. Wanner is chairman of directors and H. C. Wanner is president.

The Barbarino Motors Corporation, care of David Steinhart, 1540 Broadway, New York, a \$5,000,000 concern recently incorporated under Delaware laws to manufacture automobiles and automotive equipment, has a plant in Brooklyn, N. Y., and is manufacturing on a small scale. It proposes to enlarge its capacity in the near future but definite plans in this connection have not yet been determined. The incorporators are: David Steinhart, H. Shrek and Sidney Hirsch, all of New York.

The Burch Tool Co., Jamestown, N. Y., has been incorporated with capital stock of \$25,000 to engage in manufacturing tools and hardware. It does not intend to build for the present, but further than this its plans are not known. D. L. Carlson, Jamestown, is secretary.

The Lindell Drop Forge Co., has been organized in Lansing, Mich., with a capitalization of \$350,000, of which \$100,000 has been subscribed. The incorporators are Charles E. Lindell, George W. Jewett and Dean W. Kelley, of Lansing, and Gus F. Lindell of Chicago.

The Cico Products Corporation, 41 East Forty-second Street, New York, recently incorporated with capital stock of \$500,000 to manufacture tools and other mechanical equipment, will be in operation on a production basis within a month, making gages. Arrangements are being made for the manufacture under contract of electrical equipment. Products will be marketed directly from the factories where they are turned out. The principals are F. Kenneth Gundlach and Joseph Leopold.

The Rhode Island Oil Burner Co., Providence, R. I., recently incorporated to manufacture oil burning equipment, will confine present activities to representing the Worthington Oil Burners Corporation. Clifton I. Munroe heads the company.

The Haslett Chute & Conveyor Co., 520-22 North Sixty-first Street, Philadelphia, was recently incorporated with capital stock of \$100,000 and will manufacture spiral chutes, belt and gravity conveyors, and other transmission machinery. It plans the acquisition of the Haslett Spiral Chute Co., a partnership which has been established for about 12 years, building conveyors for handling all kinds of merchandise. The company will have offices in San Francisco, New York, Cleveland, Pittsburgh and Baltimore. It is expected that S. M. Haslett, Haslett Warehouse Co., San Francisco, will be president of the new corporation; C. H. Chubbuck, for the past 17 years with the McClintic-Marshall Co., vice-president and general manager, and P. E. Lenfestey, of the Haslett Spiral Chute Co., vice-president and manager of sales.

The American Ringless Piston Corporation, Lancaster, Pa., has been incorporated with capital stock of \$500,000 and will manufacture Thermo adjustable ringless pistons. It is now completing plans for the erection of a factory to be situated near Lancaster. Equipment has been placed. Efforts will be made to start production at an early date. The officers are: President, E. F. Herr; vice-president, J. S. Brubaker; secretary, C. A. Potts; treasurer, N. F. Herr.

The Dravo Equipment Co., Jenkins Arcade, Pittsburgh, has been incorporated with capital stock of \$100,000 to act as selling subsidiary of the Dravo-Doyle Co., manufacturers of construction and road building equipment. The new company will have exclusive representation in New York, Philadelphia, Chicago, Cleveland and Pittsburgh for concrete mixers made by the Marsh-Capron Co., Chicago, and the Kwik-Mix Concrete Mixer Co., Milwaukee. It will also handle Hotchkiss road forms and will be distributors in New York, Pittsburgh and Philadelphia of the Novo Engine Co.'s products. Leonard D. Grisham is vice-president.

The Marr-Galbreath Machinery Co., 127-129 Water Street, Pittsburgh, has been organized to deal in new and used machinery and equipment. It has a warehouse at 128 First Avenue and for the present will deal in used machinery. Later on it expects to take on a line of new machinery. M. D. Galbreath heads the company.

Pruitt-Deming-Ritchey Co., Inc., Franklin, Ind., has been organized with capital stock of \$30,000 to manufacture automotive equipment. Plans are under way to build a factory within the next year. Present manufacturing will be done under contract. No contracts have been let as yet. The incorporators are: M. D. Pruitt, N. R. Ritchey, and E. L. Deming, secretary-treasurer.

The Standard Abrasive Co., 449 Pacific Avenue, Jersey City, N. J., has been organized with capital stock of \$25,000 to manufacture abrasives. It has a factory at the above address and is in the market for equipment. Benjamin L. Drapeau heads the company.

The New England Heat-Treating Service Co., Inc., 112 High Street, Hartford, Conn., has been organized to deal in metal treating furnaces, carburizing materials, pyrometers, testers, etc., handling the products of the American Gas Furnace Co., Rodman Chemical Co., Cutler Steel Co., and the Wilson-Maeulen Co. In the near future the new company expects to build. S. P. Rockwell is president.

The Altman Mfg. Co., 71 North Street, Torrington, Conn., has been incorporated with capital stock of \$50,000 and will build various kinds of automatic machinery. Manufacturing will be done at its own plant and it is in the market for equipment. A. Altman is president.

Faralin, Inc., Seventh and Atkins Avenues, Bradley Park, N. J., has been organized to manufacture metal specialties and to do electroplating work. It has its own plant and is ready for business. J. H. Faraday is treasurer.

The McQuay Norris Mfg. Co., care of Corporation Trust Co. of America, Wilmington, Del., has been incorporated with capital of \$10,000,000 to manufacture piston pins. The company now has three fully equipped plants and does its own manufacturing. John F. Green heads the company.

The American Plywood Wheel Co., 5675 Wabash Avenue, Detroit, has been organized to manufacture disk wheels for automobiles. The company has a fully equipped plant and is now in operation. W. H. Eby is president.

The Gary Industrial Products Co., Gary, Ind., has been incorporated with capital stock of \$50,000 to act as a manufacturing unit for the Anderson Co., Gary, manufacturer of automobile parts and accessories. The new company will take over the assets of the Industrial Products Co., a going corporation of Illinois. J. W. Anderson is president and general manager.

The Steel Can't Steal Box Co., Los Angeles, Cal., recently incorporated to manufacture steel burglar-proof boxes and containers, will confine its present activities to distribution. J. Q. Mills, 428 Bradbury Building, Los Angeles, heads the company.

The Goshen Stamping & Tool Co., Jackson and Ninth Streets, Goshen, Ind., has been incorporated to take over an established business in the manufacture of machinery, tools, dies, molds, and sheet metal specialties. The business taken over will be enlarged. The company is now looking for larger plant facilities. John H. Yoder is president; George B. Slate, vice-president, and H. M. Hostetler, secretary-treasurer.

The Lloyd Tank & Equipment Co., 2 Rector Street, New York, has been incorporated with capital stock of \$100,000 and will act as Eastern and New England representative of the Sharpesville Boiler Works Co., Sharpesville, Pa. George H. Lloyd will direct the work in these territories from the New York office. No further facilities are needed at present, but with the steady increase in tank and boiler business it may be necessary later on to find warehouse accommodations.

The Milliken Signal Corporation, 110 William Street, New York, has been incorporated with capital stock of \$750,000 and will manufacture signal devices and equipment. Immediate manufacturing will be done by the McNab & Harlin Co., same address, with which F. Milliken, Sr., who heads the new company, is connected. It is likely that the new company will establish itself to do its own work finally, but nothing in this connection has been determined as yet. Mr. Milliken, together with W. C. Dickey and F. Milliken, Jr., are the incorporators.

The American Glass Machinery Corporation, 104 Fifth Avenue, New York, has been incorporated to act as an export company, dealing in glass machinery, which is to be manufactured in American factories for export business only. W. P. Graham and E. K. Kimble head the company.

The Tulsa Bearings Co., Tulsa, Okla., was recently incorporated to manufacture bearings for automotive service. No plans have been undertaken to start manufacturing at this time. G. B. Davidson, Tulsa, heads the company.

The Roulette Glass Co., Corning, N. Y., recently organized with a capital of \$3,200,000, has tentative plans for a new plant for the manufacture of vacuum bottles and kindred products. Dr. G. S. Goff is president, and Thomas F. Rogers, secretary, both of Corning. C. A. Rohland, Buffalo, is vice-president.



## Wheeling Steel Corporation Shows Net Profit

Directors of the Wheeling Steel Corporation were re-elected at stockholders' meeting April 24 and the following officers were elected: Chairman, Alexander Glass, vice-chairman, Alan H. Woodward; president, Isaac M. Scott; vice-presidents, William J. Stoop and William H. Abbott; treasurer, William H. Manning; secretary, James M. Ross.

The annual report of the company for 1922 follows:

Net earnings from operations after deducting charges for maintenance and repairs of plants of approximately \$3,100,000.....	\$4,251,777
Add-interest and income from investments, etc....	911,787
Total profits for the year.....	\$5,163,564
Idle plant expense.....	\$751,452
Provision for general depreciation.....	2,406,156
Provision for exhaustion of minerals and extinguishment of lease values.....	494,446
Dismantling charges in connection with remodeling and rehabilitating plants..	309,049
Interest and discount on bonds.....	559,533
Interest on borrowed money.....	185,083
	\$4,705,719
Net profit for the year.....	457,845
Surplus at Jan. 1, 1922.....	\$6,881,653
Liquidation of investments in associated companies	147,731
	\$6,733,923
Net profit for the year as above.....	457,845
	\$7,191,768
Deduct-dividends	
On preferred A stock 4 per cent.....	\$50,068
On preferred B stock 5 per cent.....	1,125,128
On stock of subsidiary companies not held by Wheeling Steel Corporation	5,670
	\$1,180,866
Net surplus carried to balance sheet.....	\$6,010,902

In his remarks to stockholders Chairman Alexander Glass said: "Present indications are that the extensive improvements undertaken at Steubenville for the purpose of increasing the steel output will be completed about the middle of 1923, and it is expected that the last half of this year will see a marked increase in the production of steel at this plant. On Sept. 1 wage rates increased about 20 per cent, making for higher costs of operation that were not offset by the slightly higher selling prices. Consequently, the profits for the year as shown by this report are not in keeping with the volume of business nor with our investment.

"Owning all or substantially all of the outstanding capital stock of LaBelle Iron Works, Wheeling Steel & Iron Co. and Whitaker-Glessner Co., it was decided for reasons of efficiency and economy to operate them ourselves, and therefore, all their properties except the land and buildings of the Whitaker-Glessner Co., located in New York, Chicago, Kansas City and Chattanooga, have recently been acquired, and beginning May 1, the plants of these companies are operated directly by us."

## Republic Earnings Increase

Income account of the Republic Iron & Steel Co. for the first quarter of 1923 shows net gain from operations of \$2,234,988, after deducting charges for maintenance and repairs amounting to \$1,015,541. Deductions for depreciation and interest left net profit applicable to dividends of \$1,533,843, compared with a deficit of \$712,082 in the first quarter of 1922. Surplus for the quarter, after allowing for the preferred dividend of 1½ per cent, was \$1,096,343. Unfilled orders on hand as of March 31 were 332,795 tons, as against 219,948 on Dec. 31.

## Youngstown Steel & Tube Co.'s First Quarter

Net earnings of \$3,210,724, after depreciation, depletion, interest and taxes, are reported by the Youngstown Sheet & Tube Co. for its first quarter. Deducting preferred dividend payments, earnings are equivalent to \$3.07 per share on the 987,606 shares of no par value common outstanding. Outstanding common shares include 187,606 shares which are yet to be exchanged for common stock of the Brier Hill Steel Co.

In connection with the report President J. A. Campbell said:

"The Brier Hill Steel Co. properties were taken over by the Youngstown Sheet & Tube Co., March 1, 1923, and the earnings from those properties for March are reflected in this statement.

"The preferred stock given to the Brier Hill Steel Co. in exchange for its properties was not stock of record on March 15, so that the dividends on that stock are not included in this statement. As part of the purchase price the Youngstown Sheet & Tube Co. paid to the Brier Hill Steel Co. an amount sufficient to pay the dividends due for the quarter ending March 31 on its preferred stock.

"The common stock was given to the Brier Hill Steel Co. in exchange for its properties was stock of record of March 15 and the dividend paid on that stock is reflected in this statement."

## Brier Hill Deficit

Deficit of the Brier Hill Steel Co. for the year ended Dec. 31, 1922, was \$1,697,577, cutting the surplus as of that date to \$15,526,909. Brier Hill's aggregate depreciation and depletion charge in 1922 was \$1,267,964. For the year it paid \$350,000 in preferred dividends and \$246,814 in bond interest, indicating an operating profit before these items of \$167,207.

Proceeds of the \$10,000,000 bond issue made during 1922 placed the company in a strong current position. Its aggregate of cash and call loans was \$5,896,000. Current assets of \$16,846,731 were nine times current liabilities of \$1,875,418.

Net assets available for the company's \$5,000,000 of preferred stock, according to the balance sheet at the end of 1922, were \$33,036,073, and for the 750,000 shares of common stock of no par value \$28,036,073, indicating a theoretical book value of \$37.40 a common share.

Interest attaches to the report, it being the last that ever will be made by the company, its assets having passed to the Youngstown Sheet & Tube Co.

## Industrial Finances

M. E. Musser, Lancaster, Pa., has been named temporary receiver of the Monitor Bi-Loop Radiator Co., Lancaster. Bond was fixed at \$100,000. The company admitted its temporary insolvency in reply to a bill of equity filed in the Lancaster County courts by Bernard J. Myers, former secretary of the Commonwealth, acting as attorney for the Pennsylvania Stone Cement & Supply Co.

The Alent Machine Tool Co., 479 St. Paul Street, Rochester, has filed a petition in voluntary bankruptcy. Liabilities were placed at \$11,514; assets, \$1,480.

The Lansing Forge Co., Lansing, Mich., has increased its capitalization from \$300,000 to \$500,000, to be partially paid in. The company is operating at capacity and shows an increase of 50 per cent for the first quarter of the year over the same period in 1922.

The plant of the Pittsburgh Tin Plate & Steel Corporation, Marietta, Ohio, has been placed in the hands of a receiver, Fred N. Sinks, attorney, Columbus, Ohio, being named by the court.

The James A. Brady Foundry Co., Chicago, has gone into a receivership. The federal court appointed J. L. Linquist of the Central Trust Co. receiver.

The Allis-Chalmers Mfg. Co., Milwaukee, showed net profits after taxes for 1922 of \$2,208,549, as compared with \$2,215,467 in 1921. Dividend requirements were \$2,185,641, leaving \$22,908 to be carried to surplus, as against \$29,824 in the previous year. In his annual report to the stockholders, Otto H. Falk, president, stated that unfilled orders on hand at the close of the year amounted to \$8,215,545, as compared with \$7,300,574 on Jan. 1, 1922.

The Penn Seaboard Steel Co.'s gross sales for the first quarter of this year aggregated \$1,045,039, contrasted with \$307,198 for the corresponding period last year. After operating expenses and deductions a net of \$118,221 was made, as compared with a deficit of \$42,757 last year. Fixed charges, idle plants and other expenses brought the balance for the first quarter down to \$44,443, an operating loss of \$171,466 having been shown in the first quarter of 1922.

The Mitchell Motors Co., Inc., Racine, Wis., was named in bankruptcy proceedings in the Federal court at Milwaukee, on April 18. Herbert F. Johnson, Racine, was named receiver under bond of \$50,000. Liabilities approximate \$3,000,000, and assets \$2,000,000.

Statement of earnings of the Virginia Iron, Coal & Coke Co. for the first quarter of 1923 shows net earnings, after taxes, interest, etc., of \$243,559, as against net loss of \$81,047 in the first quarter of 1922.

The Reynolds Spring Co., Jackson, Mich., shows net income for the first quarter of \$89,173, after taxes and depreciation, as compared with net of \$16,568 in the corresponding period of 1922. President Wiley R. Reynolds told stockholders that during the greater part of the quarter the factory had been greatly disorganized owing to additions under construction. This work, he expects, will be completed by July 1.

According to returns made recently by brokers, the floating supply of United States Steel Corporation common stock on March 31, last, was 1,333,884 shares or 26.24 per cent of the total issue, whereas on Dec. 31, 1922, it was 1,335,864 shares or 26.28 per cent of the total. Investors' holdings at the close of March were 3,749,141 shares, or 73.76 per cent of the issue, contrasted with 3,747,161 shares or 73.72 per cent at the close of 1922. Foreign holdings decreased 22,358 shares during the first quarter of 1923, to 239,410 shares or 4.7 per cent of the

issue. Such holdings on Dec. 31, last, stood at 261,768 shares or 5.15 per cent. Between Dec. 31 and March 31, holdings in Holland, France, Belgium, Switzerland and Germany increased, while they decreased in England, Canada, West Indies and Austria.

Statement of earnings of the Colorado Fuel & Iron Co. for the first quarter shows gross receipts of \$11,259,580, against \$6,575,661 in the same period last year. Net earnings, after payment of operating expenses, totaled \$1,395,359, against \$596,243 in 1922. Final surplus of \$382,713 is shown, against a deficit of \$431,269 in 1922.

Value of sales of the Pittsburgh Steel Co. in the nine months ended March 31, last, was almost double that of the corresponding period in the previous year, reaching \$20,587,433, against \$10,390,957 in the nine months ended March 31, 1922. Net profits for the nine months were \$1,155,031, against \$208,287 in the same period in 1922.

Ralph H. Lord has been appointed receiver of the United States Metal Goods Co., Cleveland, by the United States District Court. The Endicott Forging & Mfg. Co., New York, which petitioned for the receivership, claims that the Cleveland company has assets of \$223,000 and debts of \$196,000.

### Industrial News Items

The Jewett Radio & Phonograph Co., Detroit, has purchased the DeForest Radio Telephone & Telegraph Co. of Jersey City, N. J. Dr. Lee DeForest remains with the Jewett company as consulting engineer and the New Jersey plant will be operated but general headquarters will be in Detroit. Officers of the Detroit company are: H. M. Jewett, president of the Paige-Detroit Motor Car Co.; Frank W. Blair, president of the Union Trust Co., Detroit; Theodore Luce, formerly of Detroit and now connected with the bond house of A. C. Allyn, New York. This acquisition includes 181 radio patents.

An amalgamation has just been announced whereby the Stanley Works of Canada, Ltd., takes over the plants at Hamilton, Ont., and Roxton Pond, Que., of the Canada Steel Goods Co., The Stanley Steel Co., and the Stanley Tool Co. The head office of the company will be continued at Hamilton, Ont., under the management of Col. Arthur F. Hatch. It is the intention of the new concern to erect additional buildings at Hamilton, and also to make a number of lines which have not previously been made by these concerns in Canada. The Stanley Works, New Britain, Conn., with which the Canadian company is associated, owns and operates plants at Niles, Ohio; Newark, N. J.; Ridgewater, Mass.; Bridgeport and Plantsville, Conn.; and at Kobe, Japan. The combined companies will produce a wide range of carpenters' tools, etc., and cold-rolled steel will be made at the Hamilton plant.

As a result of successful financial negotiations which will provide \$1,500,000 new capital for the British American Nickel Co., the plants at Sudbury, Ont., and at Deschenes, Que., which have been closed for two years will resume operations. Although less than 100 men are now employed at the works, it is stated that 1000 will shortly be taken on.

It is reported that the Morrison Mill Co., of Blaine, Wash., is preparing to remove its big plant to Vancouver, B. C. This change in location is said to be a direct result of the restrictions on Canadian saw logs under the Fordney-McCumber tariff, which make it impossible for the company to compete in the export trade with mills operating in Canada.

Plans for the erection in North Vancouver, B. C., of a pulp and paper mill to cost \$8,000,000 are being completed by the Seamen Paper Co.

The Ann Arbor Machine Co. has completed the removal of its main office and factory from Ann Arbor, Mich., to Shelbyville, Ill.

The American Brake Co., St. Lou's, has elected the following officers: President, A. L. Humphreys, New York; vice-president, R. W. Williams, Southwestern manager for the Westinghouse Airbrake Co., and acting vice-president and general manager of the St. Louis plant, F. G. Williamson. S. G. Down of the Westinghouse Airbrake Co. has been elected a director to succeed the late R. E. Adreon, who was also president.

The Manufacturers Iron & Steel Co., New Brunswick, N. J., manufacturer of Bryden horse shoes and Neverslip horse shoe calks, with plants at New Brunswick, N. J., Catsauqua, Pa., and Montreal, Canada, has recently sold its land and buildings at New Brunswick and is consolidating its calk manufacturing equipment and machine shop with its plant at Catsauqua, where a new building has been erected to accommodate it. Further extensive alterations to the rolling mill equipment is now projected. The corporate name of the company has recently been changed from the Manufacturers Iron & Steel Co. to Bryden Neverslip Co., in order that the trade names of its products shall be perpetuated. The general office will be retained at New Brunswick, N. J.

### Trade Changes

H. P. Hubbell, until recently in charge of the St. Louis district office of the Midvale Steel & Ordnance Co., and J. B. Sharp, who was his assistant, have formed a partner-



H. P. HUBBELL



J. B. SHARP

ship under the name of Hubbell & Sharp to sell steel products and railroad and hardware specialties. They have opened offices at 1624 Chemical Building, St. Louis. Mr. Hubbell has been in the steel business in St. Louis for 30 years and Mr. Sharpe went there 18 years ago. Both have a wide acquaintance in the trade.

Edward J. Darby & Son, formerly at 520 North Third Street, Philadelphia, steel, iron and wire products, has moved into its new plant at 317 Vine Street.

The Continental Iron & Steel Co., 2 Rector Street, New York, has changed its address to 33 Rector Street.

The H. E. Marks Corporation, gypsum roofs, Pittsburgh, announces the appointment of Henry M. O'Grady as sales representative in Richmond, Va., and adjacent territory, with offices at 1234 Mutual Building, Richmond; also of William B. Smith as district sales representative in Texas and Louisiana, with headquarters at San Antonio, Tex.

The Matlack Coal & Iron Co., Inc., with general offices at 44 Beaver Street, New York, has opened an office in the Pennsylvania Building, Philadelphia.

The Wah Chang Trading Corporation, exporter to China of iron, steel and machinery, and importer of antimony and other Chinese products, formerly located at 233 Broadway, New York, has removed to larger offices at 30 Church Street.

Cyril J. Bath & Co., machinery dealers, Cleveland, have moved their offices from 1603 to 1738 St. Clair Avenue, offices and warehouses being now under one roof.

The Adams Axle Co., Findlay, Ohio, will move its main offices on May 1 to Syracuse, N. Y., where it has recently established a plant.

Walter-Wallingford & Co., pig iron brokers, formerly located on the fifth floor of the McCormick Building, Chicago, have taken larger quarters at Rooms 1418-20, same building.

A. L. Seaman & Co., 549 West Washington Boulevard, Chicago, has been appointed sales representative in Chicago territory for the Wolverine Tube Co., Detroit, manufacturer of seamless brass, bronze and copper tubing.

Thompson & James, manufacturers' agents, 656 Leader-News Building, Cleveland, have been appointed exclusive sales agents in northern Ohio for the Blackwood Electric Steel Corporation, Parkersburg, W. Va., which specializes in electric steel castings. The Blackwood company's new plant has been completed and is now in production. Thompson & James also represent the Transue & Williams Steel Forging Corporation, National Drawn Steel Co., Boston Pressed Metal Co. and the Blackwood Electric Steel Corporation.

The Oilgear Co., Milwaukee, has appointed the Buffalo Machinery Sales Corporation, 881 Ellicott Square, Buffalo, as sales representative for Oilgear products in the western New York territory.

The United States Electrical Tool Co., Cincinnati, has established a branch at 430 North High Street, Columbus, Ohio, E. W. Beeler in charge, and another at 412 First National-Soo Line Building, Minneapolis, Thomas H. Caley in charge.

The sales territory of Texas of the Bethlehem Steel Co. has been transferred from the Atlanta to the St. Louis district sales office, of which William Chapman is manager, who also now has charge of Missouri, Kansas, Oklahoma, Arkansas, portions of Kentucky and Tennessee and Southern Illinois.



# Machinery Markets and News of the Works

## SANTA FE ADDS TO INQUIRIES

### Western Road Sends Out List of 27 Machine Tools

#### Railroad Buying a Feature of Current Market—Demand in General Shows Some Falling Off

The past week has brought a new inquiry from the Santa Fe for 27 machines, making a total of about 100 tools for which this road has recently inquired and on which no action has been taken. The Chicago, Burlington & Quincy is expected to come into the market soon for a large quantity of shop equipment and the Elgin, Joliet & Eastern is at the point of placing orders against its large list recently sent out.

Considerable other railroad buying is developing. The New York, New Haven & Hartford Railroad has in contemplation the construction of a shop near Providence, R. I., for building electric locomotives and will eventually require considerable equipment. The Chesapeake & Ohio is expected to inquire for several hundred thousand dollars' worth of tools for a new shop and the Richmond, Fredericksburg & Potomac is building a large roundhouse, coal handling plant and ash pit at a cost of \$1,000,000, for which machinery of various types will be required. The Southern Rail-

road is also reported to be working on a large list of its requirements.

The New Orleans Great Northern Railroad has inquired for four machines, the New York, New Haven & Hartford has bought several tools for its Readville, Mass., shops, the New York Central has issued an inquiry for a few machines and the Central Railroad of New Jersey is expected to take action shortly on about 10 tools it recently inquired for. The Southern Pacific is in the market for a radial drill, shaper and punch and shear.

The Norfolk & Western Railroad has inquired for two 150-ton erecting shop cranes, two 18-in. x 8-ft. geared head engine lathes, four locomotive dome facing machines, one 20-in. x 5-ft. engine lathe, one crank pin turning machine and one 6-in. boring machine. The Philadelphia & Reading has expended about \$35,000 for heavy shop tools and the Baldwin Locomotive Works, Philadelphia, has bought several large plate working machines for a new tank shop.

Buying by industrial companies is not so active as it was a month or so ago, but a number of fair-sized orders have been placed. The American Safety Razor Corporation, Brooklyn, and the Otis Elevator Co., New York, have each bought quite a number of machines in New York. The Westinghouse Electric & Mfg. Co., Pittsburgh, has ordered six turret lathes.

## New York

NEW YORK, May 8.

MUCH of the important machine-tool business in prospect or being figured on at this time is from the railroads. Industrial companies are still buying, but in smaller volume than a month or so ago. On the other hand, the demand of the railroads for new shop equipment is continuous and there are several large projects under consideration which will create a large demand for tools if they go through. Among these is a new shop for the manufacture of electric locomotives which the New York, New Haven & Hartford contemplates building near Providence, R. I. New repair shops may also be built by the Chesapeake & Ohio. The Richmond, Fredericksburg & Potomac is already engaged in building a large roundhouse, coal-handling plant and ash pit to cost \$1,000,000. In the case of the Chesapeake & Ohio, it is reported that its machine-tool requirements may aggregate several hundred thousand dollars.

In current business the railroads are prominent. The Central Railroad of New Jersey closed bids last week on about 16 machines. The New York Central has issued an inquiry for about a half dozen tools. The New York, New Haven & Hartford has bought a number of tools for its Readville, Mass., shops. The New Orleans Great Northern Railroad has inquired for a large universal milling machine, a 36-in. lathe, and 18 or 20-in. lathe, and a 32-in. shaper. The Southern Pacific has inquired for a punch and shear, a radial drill and a shaper. Among industrial companies the General Electric Co. continues the most important buyer. Its latest inquiry calls for two 6-ft. radial drills and two engine lathes. The Otis Elevator Co., New York, has bought about \$30,000 worth of tools and the American Safety Razor Corporation, Brooklyn, has also been a fairly large buyer.

The Decorated Metal Mfg. Co., 196 Degraw Street, Brooklyn, will soon take bids for a five-story works, 25 x 100 ft., on Sackett Street, estimated to cost \$35,000. Albert Ebbecke, 194 St. Marks Avenue, is architect.

Bids are being taken by the Eberhard Faber Pencil Co., 37 Greenpoint Avenue, Brooklyn, for a new six-story plant, 80 x 195 ft., to cost approximately \$350,000, including machinery, transmission and power equipment. Magnuson & Kleinert, 52 Vanderbilt Avenue, New York, are architects. Lohar Faber heads the company.

A manual training department will be installed in the addition to be erected at the high school, Ilion, N. Y., estimated to cost \$200,000. The Union Free High School District No. 1, R. B. Redway, president, is in charge.

Morris Loewy, 200 Fifth Avenue, New York, machinery dealer, has inquiries out for an I-beam hoist, from 1 to 2 tons capacity.

Fire, May 1, destroyed a portion of the power house and other departments of the plant of the Cornwall Chemical Co., Cornwall, N. Y., with loss estimated at \$100,000, including machinery. It is planned to rebuild. New York offices are at 111 Water Street.

The Rubel Coal & Ice Corporation, Glenmore Avenue, Brooklyn, is having plans drawn for a new one-story ice plant, 50 x 150 ft., estimated to cost \$50,000. Edward M. Adelson, 1778 Pitkin Avenue, is architect.

A manual training department will be installed in the proposed high school to be erected at Haverstraw, N. Y., estimated to cost \$150,000, for which an architect will soon be selected. The Board of Education is in charge.

Henry Shultz, 26 Cherry Street, New York, manufacturer of ice cream freezers, refrigerating equipment, etc., has acquired the one-story and basement factory of the Prest-O-Lite Co., at Long Island City, on site 200 x 250 ft., for a new plant.

The Atlas Novelty Co., 722 East Eleventh Street, New York, manufacturer of composition products, has awarded contract to Ellman & Rosen, 102 Clymer Street, Brooklyn, for a two-story factory, 40 x 112 ft., at Long Island City. Walter B. Wills, 1155 Myrtle Avenue, Long Island City, is architect.

The Pan-American Petroleum & Transport Co., 120 Broadway, New York, will build an oil storage and distributing plant in connection with its new refinery at San Pedro, Los

## The Crane Market

Inquiries for overhead traveling cranes continue fairly active in the New York district, but less activity is evident in locomotive cranes. A few new inquiries for locomotive cranes are reported, among these one from the Atlantic Coast Line Railroad, Wilmington, N. C., asking for bids on a locomotive crane to lift 30 tons at 30-ft. radius and travel 15 miles per hr. under its own power. The Central Railroad of New Jersey, in addition to the 25-ton gantry crane, which it is about to place, is on the point of closing for three locomotive cranes. The Browning Co. has been awarded a 15-ton locomotive crane for export to South America through a New York exporter. In the Middle West one of the largest overhead crane awards this year has been made by the Denver & Rio Grande Railroad to the Whiting Corporation through its Chicago office. The order amounted to about \$300,000.

Among recent purchases are:

American Car & Foundry Co., 165 Broadway, New York, a 10-ton, 100-ft. span electric traveling crane and a 3-ton electric hoist from the Pawling & Harnischfeger Co. and a used 5-ton, 47-ft. span electric crane from the Industrial Equipment Co., 149 Broadway, New York.

Viele, Blackwell & Buck, 49 Wall Street, New York, a 30-ton, 25-ft. span overhead traveling crane for the Adirondack Power & Light Corporation, Amsterdam, N. Y., from the Northern Engineering Works.

Atlantic Wire Co., Branford, Conn., a 1-ton, 60-ft. span, electric traveling crane from the Shepard Electric Crane & Hoist Co.

U. G. I. Contracting Co., Philadelphia, a 10-ton locomotive crane for use at Manchester, N. H., from the Orton & Steinbrenner Co.

Wilson & English Construction Co., 50 Church Street, New York, a 15-ton locomotive crane for use at Millvale, Pa., from the Brown Hoisting Machinery Co.

Philadelphia & Reading Railroad, Philadelphia, two 23-ton locomotive cranes from the McMyler Interstate Co., and a 35-ton, 72-ft. span, gantry crane with 5-ton auxiliary, from an unnamed builder.

Des Moines Electric Co., Des Moines, Iowa, a 4-motor, 41-ft. span overhead traveling crane to handle grab bucket, from the Northern Engineering Works.

Interborough Rapid Transit Co., New York, a 30-ton, 45-ft. span, 3-motor, overhead traveling crane from the Northern Engineering Works.

Semi-Steel Test Foundry, Chicago, a 7½-ton, 36-ft. span,

3-motor, overhead traveling crane for installation in a foundry, from the Northern Engineering Works.

Columbia Granite Co., Westerly, R. I., a 20-ton, 2-motor, overhead traveling crane from the Lane Mfg. Co., Montpelier, Vt.

Sullivan Granite Co., Westerly, R. I., a 20-ton electric traveling crane from the Lane Mfg. Co., Montpelier, Vt.

Power Specialty Co., Dansville, N. Y., a 16-ton, 100-ft. span electric traveling crane from the Shaw Electric Crane Co.

Pratt & Letchworth, Buffalo, a 10-ton, 100-ft. span electric traveling crane from the Shaw Electric Crane Co.

Burlington Steel Co., Hamilton, Ont., a 10-ton, 65-ft. span electric traveling crane from the Shaw Electric Crane Co.

Buffalo, Rochester & Pittsburgh Railroad, Buffalo, N. Y., two ash pit cranes from the Shaw Electric Crane Co.

Atlas Steel Corporation, Dunkirk, N. Y., a 5-ton electric traveling crane from the Shepard Electric Crane & Hoist Co.

The Seneca Steel & Iron Co., Buffalo, two 10-ton 65-ft. span electric traveling cranes from an unnamed builder.

## The Pittsburgh Market

The crane market in Pittsburgh is fairly active although more so in the matter of inquiries than sales.

Carnegie Steel Co. is inquiring for two 5-ton jib spout cranes in connection with the extension of the open-hearth department, Edgar Thomson works, Braddock, Pa.

Latrobe Electric Steel Co., Latrobe, Pa., is in the market for a 5-ton crane.

Westinghouse Electric & Mfg. Co. is asking prices on a 3-ton crane for East Pittsburgh.

H. C. Frick Coke Co., Pittsburgh, is inquiring for three 2-ton, 24-ft. cranes to run on an I beam, a 10-ton overhead and three 1-ton hoists for its Everston, Pa., operation.

Jones & Laughlin Steel Corporation is enlarging its warehouse for the handling of structural steel and has ordered a 10-ton, 2-motor trolley from the Alliance Machine Co. to go on the crane now serving the warehouse.

There is an inquiry for prices for estimating purposes on five cranes for a new sheet or tin plate plant to be erected near Huntington, W. Va. Identity of prospective buyer is withheld.

Pressed Steel Car Co., Pittsburgh, is taking prices on four 2-ton hoists.

Angeles, Cal., with capacity of more than 700,000 bbl. Including the refinery, on which work is under way, the plant will cost in excess of \$1,500,000.

The Board of Education, Yonkers, N. Y., has authorized plans for the construction of an addition to the Saunders' trade and vocational school, to cost in excess of \$125,000. Chamberlain & Fairbrooke, 18 South Broadway, are architects.

The Lion Brewery, Columbus Avenue and 108th Street, New York, has awarded a general contract to Cunningham & Foley, 219 West 116th Street, for a two-story and basement ice-manufacturing and refrigerating plant, 96 x 115 ft., estimated to cost \$100,000. A. G. Koenig & Co., 405 Lexington Avenue, are architects. Hugh A. Murray is president.

The Adirondack Power & Light Corporation, 511 State Street, Schenectady, N. Y., is planning the construction of a hydroelectric generating plant near Dolgeville, N. Y., to cost approximately \$200,000. It will be located on East Canada Creek.

A manual training department will be installed in the new junior high school to be erected at Amsterdam, N. Y., estimated to cost \$450,000, for which plans have just been authorized by the Board of Education.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, will build a one-story power house, 51 x 80 ft., at 179 Hudson Avenue, estimated to cost \$100,000, with equipment.

A manual training department will be installed in the two-story high school to be erected on Laurel Avenue, Northport, N. Y., estimated to cost \$280,000, for which bids are being asked on a general contract until May 14. Coffin & Coffin, 522 Fifth Avenue, New York, are architects.

The American Cable Co., Garwood, N. J., recently organized under Delaware laws with a capital of \$3,000,000, will take over and merge the George C. Moon Co., with local

plant; the Upson-Walton Co., Newark, N. J.; and the Pittsburgh Wire Rope Co., Verona, Pa., all specializing in the manufacture of wire rope and wire products. Plans are in progress for expansion. C. H. Mathews is president of the consolidated company and George C. Moon, vice-president and treasurer.

Fire, May 4, destroyed four buildings and machinery at the plant of the Whitall-Tatum Co., 46 Barclay Street, New York, at South Millville, N. J., manufacturer of bottles and other glass containers, comprising furnaces Nos. 9, 10, 11 and 12, with loss estimated at \$500,000, including machinery and power equipment. It is planned to rebuild.

A one-story power house and ice-manufacturing plant will be constructed at the Colony for Feeble Minded, New Lisbon, N. J., to cost \$35,000, for which bids will be called by the Department of Charities and Corrections, Trenton, N. J. A. B. Mills, State Office Building, Trenton, is engineer.

Emil Stremlau, Room 209, Board of Trade Building, 217 Smith Street, Perth Amboy, N. J., is organizing a company to build a refinery to operate under a special process, with initial capacity of 100,000 gal. per day. It will cost about \$50,000 with equipment.

The Borough Council, Woodstown, N. J., has authorized the installation of a new pumping engine and auxiliary equipment at the municipal waterworks.

A power plant will be constructed by the Cunard Steamship Co., Ltd., 25 Broadway, New York, in connection with its four new 1000 ft. piers on the Hudson River, extending from Eighteenth Street to the West Shore Railroad terminal, Weehawken, N. J., estimated to cost \$3,000,000. Electrically-operated freight-handling and conveying machinery will be installed.

The Upton Iron Works, 159 West Kinney Street, Newark, has acquired property, 50 x 175 ft., at 285-87 Freling-



huysen Avenue, for the erection of a new plant, for which plans will be prepared at once.

The Board of Education, Essex County Vocational Schools, Essex Building, Newark, will take bids until May 23 for tools and other equipment for the County vocational schools, as per specifications on file. Robert O. Beebe is director.

The Common Council, National Park, N. J., is planning the installation of electrically-operated pumping machinery at the municipal waterworks.

The Home Oil Burner Co., 251 Main Street, Hackensack, N. J., has been organized to manufacture oil burners and equipment. Manufacturing for this year will be done under contract. Plans have not as yet fully matured but the company expects to be in production soon. J. W. Barbrick heads the company.

The Lockford Co., care of General Automotive Corporation, 36 West Forty-fourth Street, New York, was recently organized to manufacture products for automotive service. Various parts consisting of drop forgings, machining, special steel pins and cylinder locks will be made under contract. F. A. Goudane is general manager.

The Auto License Lock Corporation, 138 West Broadway, New York, recently incorporated with capital stock of \$1,000,000, is now manufacturing locks for automotive service in a plant of limited capacity. A site is being selected in Brooklyn, N. Y., for a factory which will be built as soon as possible to fill in a program of rapid expansion. The company will be in the market for equipment. The principals are J. Fried and J. D. Selden.

The Eastern Tube & Steel Corporation, Brooklyn, N. Y., has been incorporated with capital stock of \$450,000 and will engage in manufacturing steel tubing and kindred products. It will acquire the assets and business of the Empire Tube & Steel Corporation, College Point, L. I., which recently passed into receiver's hands, and will continue along the lines established by the old company. Present activities are given to a complete reorganization. The incorporators are: E. W. Blunt, C. J. and H. W. Thompson. William Klein, College Point, represents the company.

The Ace Electric Cord Adjuster Co., Twenty-fifth Street and Park Avenue, New York, has been incorporated with capital stock of \$20,000 to manufacture electrical equipment. It is expected that immediate manufacturing will be let out to contract. The incorporators are G. F. Brown, A. Helfat and W. H. Oakes.

The Little Fireplace Heater Co., Great Neck, L. I., was recently incorporated with capital stock of \$40,000 to manufacture stoves and heaters. It has not been decided as yet whether the company will do its own manufacturing or let it out on contract. The incorporators are J. H. Hassinger, H. Litt and C. Moise. G. W. Elkins, 34 Pine Street, New York, represents the company.

## New England

BOSTON, May 7.

MAY starts off quietly in the New England machine tool market and the aggregate number of tools sold the past week and the value fell below that of the previous week. A special hydraulic press, taken by a Massachusetts maker of textile machinery, is the most important sale. Buying continues to represent replacements of worn out tools or something in the way of special production equipment. Expansion in the New England metal-working industry is practically at a standstill. The most active inquiry of importance concerns 10 14-in. lathes, wanted by a Providence manufacturer.

Notwithstanding the apparent indifference of buyers, dealers and manufacturers of tools are fully maintaining prices. The tendency to cut prices on lathes, noted a month or so ago, is eliminated, especially on the less expensive makes, the margin of profit on which is considerably less because of rising costs of production.

Several granite and stone companies are sounding the market on moderately large cranes, but no real inquiry has developed.

Circular gravity conveying machinery and other equipment is required by the Commercial Wharf Co., 67 Commercial Wharf, Boston, for its proposed three-story, 60 x 500 ft., manufacturing plant and warehouse.

The Boston Elevated Railway Co. is taking bids for high pressure piping, regulators, gages, valves, coal and ash conveying machinery for a power house for its new shops at Ewerett, Mass.

The Hedstrom-Union Co., Gardner, Mass., children's carriage wheels, has plans for a four-story, 64 x 200 ft., manufacturing unit on Main Street, to be operated by local electric power. No specified time has been set for construction to begin.

Sketches have been made for a 135 x 240 ft. plant to contain three units for the Hunt-Spiller Mfg. Corporation, Dorchester Avenue, South Boston.

Drop hammers, trimming and power presses, engine lathes, milling machines, die sinkers, grinders and other machine tool equipment, together with the plant of the Revere Drop Forge Co., Revere, Mass., were sold at auction the past week.

The plant of the Ellsworth Foundry & Machine Works, Ellsworth, Me., was recently destroyed by a flood. Loss included a pattern shop foundry and machine shop.

The Union Cutlery & Hardware Co. Unionville, Conn., has sold its plant and water privilege to Charles W. House & Son, Inc., whose property adjoins. The cutlery company will build a new plant on another site.

The plant formerly occupied by the Knox Motors Co., Wilbraham Road and Waltham Avenue, Springfield, Mass., has been purchased by the M. & W. Co., Taylor Street, manufacturer of electric bulbs and similar supplies.

The American Steel & Wire Co., Worcester, Mass., is with two exceptions to substitute electric for steam power at its mills. The blooming and rod mills at Quinsigamond will continue to operate with steam power.

A one-story power house will be constructed at the new two-story high school to be erected in the Deering District Portland, Me., which will also include a manual training department. It will be 70 x 428 ft., estimated to cost \$700,000. Work has commenced.

The Alger Box Co., Gardiner, Me., has tentative plans for rebuilding the portion of its paper box manufacturing plant, including power house, destroyed by fire April 25 with loss estimated at \$100,000. Headquarters of the company are at Middleboro, Mass.

L. D. Greene, Boston, operating a machine shop at 659 Columbia Road plans the installation of a number of machine tools, small tools and transmission equipment.

The Instant Electric Water Heater Co., Bridgeport, Conn., recently organized with a capital of \$250,000, will succeed to the business of the Bridgeport Mfg. Co. A plant has been leased at Knowlton Street and East Washington Avenue. H. E. Dineson is president.

A manual training department will be installed in the new Augusta Lewis Troup junior high school to be erected on Edgewood Avenue, New Haven, Conn., estimated to cost \$800,000, for which ground will be broken at once. Charles S. Palmer, New Haven, is architect.

The Veeder Mfg. Co., Garden Street, Hartford, Conn., manufacturer of recording instruments and precision equipment, has secured a permit for the erection of a new plant to cost \$71,000.

The Twin State Gas & Electric Co., 160 State Street, Boston, is arranging for a new hydroelectric generating plant at Gorham, N. H., estimated to cost \$250,000. R. J. Andrus is company engineer in charge.

The Winchester Repeating Arms Corporation, New Haven, Conn., will close the plant of its subsidiary, Barney & Berry, Inc., Springfield, Mass., manufacturer of ice skates, about June 1, and will discontinue operations there. The machinery will be removed to the main works at New Haven.

Work will commence on a one-story power plant, 50 x 100 ft., with brick stack, at the new hat factory of the Crofut & Knapp Co., South Norwalk, Conn., for which a contract has been awarded to the Turner Construction Co., New York. It will cost \$80,000. The entire plant will represent an investment of \$1,000,000.

The Connecticut Brass Foundry Co., 600 East Main Street, Waterbury, Conn., has awarded contract to H. F. Wenzel, Glen Ridge Street, for a new two-story foundry estimated to cost \$40,000.

A manual training department will be installed in the high school to be erected at Ware, Mass., estimated to cost \$125,000. J. D. Leland & Co., 41 Mount Vernon Street, Boston, are architects.

A manual training department will be installed in the junior high school to be erected at Marlboro, Mass., estimated to cost \$130,000. Charles M. Baker, 25 Arch Street, Boston, is architect.

The Southington Hardware Co., Center Street, Southington, Conn., has awarded contract to the H. Wales Lines Co., Meriden, Conn., for a two-story addition, 50 x 115 ft., estimated to cost \$60,000.

## Philadelphia

PHILADELPHIA, May 7.

A ONE-STORY power house will be built at the new textile mill of the Largman-Gray Co., 3360 Frankford Street, Philadelphia. The plant will cost \$300,000.

Bids have been called on a general contract by the Bureau of Yards and Docks, Navy Department, Washington, for a one-story engine testing plant at the Philadelphia Navy Yard.

Fire, May 4, destroyed a portion of the plants of the Keystone Spring Works and the Samson Pattern & Model Co., Philadelphia, located in the building at Thirteenth and Buttonwood Streets, with combined loss estimated at \$50,000.

The Penn Metal Works, Inc., 317 North Sixth Street, Philadelphia, plans the installation of a new punch, with about 8 in. cutting stroke.

The Knight Appliance Co., Inc., Drexel Building, Philadelphia, manufacturer of water heaters, etc., has acquired a building at 18 South Twentieth Street, 20 x 52 ft., for extensions.

The Philadelphia Commercial Museum, Thirty-fourth Street, Philadelphia, has received an inquiry from Harbin, Manchuria, for black and brassed springs; the company is also in the market for steel furniture.

H. Harry Paul, 631 North Broad Street, Philadelphia, automobile equipment and supplies, has leased a six-story building, 62 x 106 ft., to be erected at 1214-20 Filbert Street, estimated to cost \$90,000, for a new plant. A machine shop and automobile repair plant will be installed.

The Victor Talking Machine Co., Camden, N. J., has broken ground for extensions, estimated to cost \$1,000,000, with machinery.

The William R. Thropp & Sons Co., East State Street, Trenton, N. J., machinist, has awarded contract to the James H. Morris Co., Inc., 211 North Montgomery Street, for a one-story machine shop.

The Jointless Fire Brick Co., 1130 Clay Street, Chicago, will commence the erection of the first unit of its branch plant on New York Avenue, Trenton, N. J., estimated to cost \$40,000. The James H. Morris Co., Inc., 211 North Montgomery Street, Trenton, is contractor.

A manual training department will be installed in the new two-story and basement high school to be erected at Springfield, Pa., estimated to cost \$200,000, for which bids will soon be asked on a general contract by Ritter & Shay, North American Building, Philadelphia, architects.

The County Controller, P. J. Schmidt, Wilkes-Barre, Pa., is taking bids until May 18 for machine tools and other equipment for the County machine shop.

The Sullivan County Electric Co., Laporte, Pa., has acquired the Tunkhannock Electric Co., Tunkhannock, Pa., and contemplates extensions in the plant and system, including the installation of additional equipment.

The Pottstown Cold Storage Co., Pottstown, Pa., will install additional equipment, including air compressors, air tanks, transmission and operating machinery.

A manual training department will be installed in the proposed high school to be erected at Windber, Pa., estimated to cost \$175,000, for which an architect will soon be selected.

Fire, May 3, destroyed a portion of the mill and power house of the Ball Lumber Co., Mahanoy City, Pa., with loss estimated at \$75,000, including machinery. It is planned to rebuild.

The Harrisburg Building Block Co., Harrisburg, Pa., has acquired three acres of land at Cameron and Reilly Streets for the erection of a new one-story plant, 92 x 130 ft., for the manufacture of concrete blocks and kindred specialties. Thomas F. Bausman is one of the heads of the company.

The Gettysburg Ice & Cold Storage Co., Gettysburg, Pa., is planning the erection of an addition to its ice-manufacturing plant and will install considerable new equipment.

A manual training department will be installed in the new three-story high school, 100 x 110 ft., to be erected at Shippensburg, Pa., estimated to cost \$160,000, for which bids on a general contract will be called early in June. J. C. Dempwolf, York, Pa., is architect.

The Danville Galvanizing Co., Danville, Pa., recently organized with a capital of \$50,000, is planning the establishment of a new plant to manufacture galvanized metal products. The company is headed by Harold R. Pursel and Irving Vannan, Jr., both of Danville.

Fire, May 2, destroyed a portion of the plant of the Norristown Iron & Steel Co., Norristown, Pa., with loss estimated at \$25,000. It will be rebuilt.

A manual training department will be installed in the proposed high school at Hellam, Pa., estimated to cost \$100,-

000, for which bids will be asked at an early date on a general contract.

The United Gas & Electric Co., 61 Broadway, New York, operating the Harrisburg Light & Power Co., Harrisburg, Pa., has acquired a number of electric companies in the vicinity of Lancaster, Pa., and plans extensions and improvements and the installation of additional equipment.

The Glen Alden Coal Co., West Pittston, Pa., has acquired the plant of the Exeter Machine Co., which will be extended and improved for the manufacture and repair of coal breaker machinery and kindred work.

The East Fayetteville Grain & Feed Co., East Fayetteville, Pa., is considering plans for rebuilding the portion of its power house, planing mill and lumber plant recently destroyed by fire with loss estimated at \$75,000, including machinery. The company is operated by Ausherman Brothers.

The Upper Hanover Light & Power Co., Allentown, Pa., is being organized under State laws to build a power plant and system in the Upper Hanover section, Montgomery County. It is headed by C. M. Walter and P. B. Sawyer, Thomas J. Perkins, Allentown, is representative. It is understood that the new company will be affiliated with the Pennsylvania Power & Light Co., Allentown.

The Rowe-Stuart Motors Corporation, Rossmore, Pa., is perfecting plans for rebuilding the portion of its motor truck plant, recently destroyed by fire with loss estimated at \$300,000.

## Pittsburgh

PITTSBURGH, May 7.

REPORTS of machine tool business still are somewhat mixed but the predominating one is that orders are gaining again, following the reaction in April. While a lack of sufficient men is advanced by some as the reason for delaying purchases, that is the motive back of orders by others. Labor is so short that the more general tendency is toward putting in equipment calculated to reduce the number of men required. The trade is encouraged by an inquiry from the Pennsylvania Railroad for a number of small tools for its Conway, Pa., shops. The United Engineering & Foundry Co. has plans for modernizing its Frank-Kneeland plant in Pittsburgh, and several motor-driven lathes are listed among the tools to be bought.

The Virginian Railway has decided to electrify 213 miles of track lying between Roanoke, Va., and Mullens, W. Va., involving an expenditure of \$15,000,000. The order for the electric locomotives, power house, transformer stations and other apparatus has been awarded to the Westinghouse Electric & Mfg. Co. and forms the largest railroad electrification contract ever placed. The division to be electrified crosses the Allegheny Mountains. The alternating current, single phase system will be used.

Property at Blawnox, near Pittsburgh, used by the Government during the war, has been leased by the Blaw-Knox Co., Farmers' Bank Building, Pittsburgh, with structural steel and iron plant in this section, and will be used for extensions. The building will be modernized and equipped for manufacture.

The Calorizing Co. of Delaware, Inc., has been organized under Delaware laws to take over and expand the Calorizing Co. of Pittsburgh, Oliver Building, with plant on Hill Avenue, devoted to the manufacture of heat-treating equipment and special metal processing. A stock issue of \$625,000 is being sold, a portion of the proceeds to be used for expansion. The General Electric Co. is interested in the new organization, of which Brooke L. Jarrett is president, and A. V. Farr, vice-president.

Fire, May 2, destroyed a portion of the plant of the United States Cast Iron Pipe & Foundry Co., Scottsdale, Pa., with loss estimated at \$100,000 including equipment. It is planned to rebuild. Headquarters of the company are at 71 Broadway, New York.

The Liggett Spring & Axle Co., Monongahela, Pa., is planning the installation of machine tools and other equipment. S. C. Liggett heads the company.

The Bessemer & Lake Erie Railroad Co., Union Arcade, Pittsburgh, is completing plans for a one-story machine shop at Greenville, Pa., to cost \$60,000. T. T. Porter is company engineer.

A manual training department will be installed in the new David B. Oliver high school to be erected at Brighton Road and Island Avenue, Pittsburgh, estimated to cost \$500,000, for which bids are being received on a general contract until May 17.



The Pittsburgh-Erie Saw Co., 4017 Liberty Avenue, Pittsburgh, has leased a two-story building at 1006 Grant Street, Akron, Ohio, for a branch plant. It will continue the operation of its other branch works at Erie, Pa.

A power plant will be built in connection with the new hospital to be established at Ebensburg, Pa., by the Cambria County Commissioners and the Johnstown Society for the Prevention of Tuberculosis, both of Johnstown, Pa., estimated to cost \$300,000. W. R. Myton, First National Bank Building, Johnstown, is architect.

The Pittsburgh Transformer Co., Columbus and Preble Avenues, Pittsburgh, manufacturer of electrical equipment, has acquired property at Juniata and Metropolitan Streets for extensions. R. V. Bingay is president.

A manual training department will be installed in the new high school to be erected at Wierton, W. Va., estimated to cost \$200,000, for which bids on a general contract will be received until June 1. Peterson & Clarke, Steubenville, Ohio, are architects.

The Evert Coal Co., Union Bank Building, Clarksburg, W. Va., recently organized, will take bids until June 1 for electrical equipment and mining machinery for its properties at Wellsburg, W. Va. K. G. Davis is president and Louis Carr, secretary.

The Champion Tool Co., Pine Street, Meadville, Pa., will commence the erection of an addition to cost about \$100,000, including machinery.

Motors, conveying machinery and other equipment will be installed in the three-story and basement printing plant to be erected by the Eagle Printing Co., Butler, Pa., estimated to cost \$110,000.

A manual training department will be installed in the new high school to be erected at Perryopolis, Pa., estimated to cost \$100,000, for which bids have been called on a general contract. Conrad C. Compton, Donora, Pa., is architect.

The National Concrete Block Corporation of Delaware, Pittsburgh, has acquired property, 200 x 225 ft., on Westhall Street for the establishment of a new plant to manufacture concrete blocks and kindred products. John W. Magee is interested in the company, which was recently organized.

The Woodlawn Water Co., Woodlawn, Pa., will install new electrically-operated pumping machinery, including one 2,000,000-gal. unit and one 1,000,000-gal. centrifugal pump, with steel tanks and miscellaneous equipment, estimated to cost \$200,000. The Morris Knowles Co., Westinghouse Building, Pittsburgh, is engineer.

## Baltimore

BALTIMORE, May 7.

THE STANDARD SANITARY MFG. CO., Pittsburgh, has taken title to 48 acres at Fifth Avenue and Seventeenth Street, Baltimore, which will be used as the site for its new plant, to cost about \$3,000,000.

The Codd Tank & Specialty Co., 115 South Street, Baltimore, is seeking a manufacturer to engage on a contract basis to make malleable iron pipe unions.

Bids will be called about May 15 by the Maryland Toy Mfg. Co., First and Dillon Streets, Baltimore, for rebuilding the portion of its three-story plant recently destroyed by fire with loss of \$75,000, including machinery. John Freund, 1307 St. Paul Street, is architect.

The Industrial Alcohol Co., Curtis Bay, Baltimore, is planning the erection of new works to cost \$750,000, including power house, machine shop and other buildings. The main factory will be equipped as a reclamation plant for the production of potash and kindred products.

D. C. Elphinstone, 408 Continental Building, Baltimore, machinery dealer, is in the market for a locomotive crane, about 20 tons capacity, with 50 ft. boom.

Fire, May 1, destroyed the power house and a portion of the plant of the Hopewell China Co., Hopewell, Va., with loss estimated at \$100,000 including machinery. It is planned to rebuild at once.

A one-story central power plant, estimated to cost \$200,000, will be constructed by the Board of Works, Baltimore. Lawrence H. Fowler, 307 North Charles Street, is architect.

The Purchasing Clerk, Bureau of Engraving and Printing, Washington, will take bids until May 12 for three motor-driven, ball-bearing, sliding-head, bench type drilling machines, also for one duplex, motor-driven milling machine, and one motor-driven hacksaw machine.

The Marion Lake Club, Marion, N. C., J. Q. Gilkey, president, is making inquiries for an isolated electric light and power plant.

The Wilkinson Machine Works, Inc., Savannah, Ga., has been organized to take over the plant and business of the Wilkinson Machine Co. Plans are under way for enlargement to include the installation of additional machinery.

C. G. Wilkinson is president and J. H. Craggs, Jr., general manager.

The Georgia Agricultural Works, Fort Valley, Ga., is in the market for a 20 hp. boiler and auxiliary power equipment.

The Dawson Cotton Oil Co., Dawson, Ga., has inquiries out for a 50 hp. oil-operated engine, with auxiliary equipment.

The Baltimore Ice Mfg. Co., Baltimore, has awarded general contract to J. J. Walsh & Son, Preston and Charles Streets, for a two-story ice-manufacturing plant, 60 x 175 ft., estimated to cost \$150,000, including equipment. A site has been acquired at 409-11 North Asquith Street.

The Norfolk & Western Railway Co., Roanoke, Va., has awarded a general contract to the Pettyjohn Co., Lynchburg, Va., for new locomotive and car repair shops and power house at Shenandoah, Va., estimated to cost \$450,000.

The Bristol Gas & Electric Co., Bristol, Va., is contemplating extensions and improvements in its plant and system to cost about \$60,000. W. A. Hiddleston is general manager.

The Savannah Co-operative Creamery Co., Savannah, Ga., is in the market for refrigerating and ice machinery.

Plans of the Baltimore Paint & Color Works, Frederick and Calverton Roads, Baltimore, whose plant was recently destroyed by fire, call for the construction of a three-story, 60 x 150 ft. plant to cost about \$60,000. It will about double the former output.

The Atlantic Coast Line Railroad Co., Wilmington, N. C., will commence the installation of automatic coaling plants at Rocky Mount, N. C., and Florence, S. C., each with capacity of 500 tons, estimated to cost \$200,000. J. E. Willoughby is chief engineer.

The Union Cotton Oil Co., Fitzgerald, Ga., is planning the erection of a box-manufacturing factory, estimated to cost \$55,000 with machinery.

The Virginia Table Co., Marion, Va., is planning for enlargements to include the installation of additional machinery. It has increased its capital from \$600,000 to \$1,000,000 to provide for the expansion.

R. P. Johnson, Wytheville, Va., machinery dealer, is in the market for an industrial locomotive, 12 in. gage, in good condition; also for a 36 in.-gage locomotive, about 20 tons capacity.

Bids will be taken by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 29, for 48 electric drills and 7 electric grinders, schedule 782.

A manual training department will be installed in the new high school to be erected at Marion, S. C., estimated to cost \$100,000. The Board of Education is in charge.

The Taylor-Parker Co., Water Street and Commerce Place, Norfolk, Va., operating a machine shop, plans the installation of a lathe, grinder and other machine tools, bench and hand tools.

P. W. Wiley, 1306 E Street, N. E., Washington, is in the market for coil spring motors.

Plans are under way for a one-story power house at the Agricultural and Technical College, Greensboro, N. C., to cost about \$50,000. Harry Barton, Greensboro, is architect.

A manual training department will be installed in the high school to be erected at Eighth and Walnut Streets, Lumberton, N. C., estimated to cost \$135,000, for which bids will soon be asked by the Board of Education.

Electrically-operated pumping equipment will be installed in the proposed municipal waterworks to be constructed by the Common Council, Elkton, Va., estimated to cost \$75,000.

The J. L. Talbert Iron & Steel Co., Inc., South Church Street, Charlotte, N. C., recently organized, has awarded contract to the Truscon Steel Co., Youngstown, for the erection of an initial plant unit. It will operate with a capital of \$100,000. T. L. Talbert is president and general manager.

The Wyatt Rubber & Chemical Co., 730 North Eutaw Street, Baltimore, recently organized, plans the immediate installation of power equipment, mixing and other machinery in a local building. Charles M. Wyatt is president and secretary.

The Harry Brown Co., Gastonia, N. C., general contractor, is planning for the installation of portable conveyors and unloaders, power-operated and gravity type.

A manual training department will be installed in the new school to be erected by the Tans Bay School Trustees, Florence, N. C., for which ground will be broken at once. It will cost about \$90,000. L. McD. Hicks, Florence, is architect.

The general purchasing officer, Panama Canal, Washington, will receive bids until May 19 for pneumatic grinders, steel springs, rivets, valves, steel conduit and other equipment, as specified in circular 1526.

The Southern Power Co., Charlotte, N. C., has plans for three new electric generating plants, comprising a hydro-electric station with capacity of 80,000 hp., and two steam-operated plants of 40,000 and 20,000 hp., each, respectively.

## Detroit

DETROIT, May 7.

**P**LANS will soon be prepared for a new four-story paper mill and power house at Howlandburg, Mich., by the El-Mora-Lee Paper Co., 839 Lake Boulevard, Kalamazoo, Mich., estimated to cost \$400,000 with machinery. The company was organized recently by Irving Hopper, formerly general superintendent of the Kalamazoo Stationary Co., and associates.

Manual training equipment will be installed in the two-story high and grade school to be erected at Grand Rapids, Mich., estimated to cost \$530,000. Robinson & Campau, Michigan Trust Building, are architects.

The American Nut Co., 676 West Grand Boulevard, Detroit, is planning for the installation of additional equipment, including a screw machine.

The Rich Steel Products Co., Battle Creek, Mich., has tentative plans for enlargements and the installation of additional machinery. It is also planning to expand its works at Los Angeles, Cal., and purposes to erect additional buildings. To carry out the expansion, a portion of a stock issue of \$700,000, now being sold, will be used.

The Michigan Tool Co., 147 Joseph Campeau Avenue, Detroit, is taking bids for a one-story addition, estimated to cost \$30,000. C. D. Lundblad, New Telegraph Building, is architect. Robert H. Anderson is one of the heads of the company in charge.

The Buick Motor Co., Flint, Mich., has plans for a one-story addition to its works on Hamilton Avenue, 60 x 300 ft.

A manual training department will be installed in the proposed high and grade school to be erected at Davison, Mich., estimated to cost \$85,000. G. G. Finster, 112 Paterson Building, Flint, Mich., is architect.

The New Egyptian Portland Cement Co., Port Huron, Mich., will install machinery at its new local mill, now nearing completion. A power house will be operated in connection with the plant.

Turner, Crimmins & Walter, Inc., Big Rapids, Mich., has plans for a one-story machine and repair shop, to include a department for parts production, operated in conjunction with a local automobile business. Lane, Davenport & Peterson, Dime Bank Building, Detroit, are architects.

## Buffalo

BUFFALO, May 7.

**A**N ice and refrigerating plant will be installed in the municipal market building, 50 x 275 ft., to be erected by the Department of Parks and Public Buildings, Municipal Building, Buffalo, for which bids will soon be asked. Howard L. Beck, department offices, is architect.

The Jamestown Metal Desk Co., Blackstone Avenue, Jamestown, N. Y., plans the erection of a one-story addition, 75 x 170 ft., to cost approximately \$60,000.

The R. T. Jones Lumber Co., Little Island, Tonawanda, N. Y., has acquired 20 acres on Tonawanda Island for extensions, to include a new electrically-operated planing mill, power house and other buildings.

A manual training department will be installed in the new high school to be erected at Phelps, N. Y., estimated to cost \$165,000, for which bids will be called on a general contract this month. Foote & Carpenter, 154 East Avenue, Rochester, N. Y., are architects.

Fire, April 30, destroyed the plant of the Worlock Stone Crushing Co., Perryville, N. Y., with loss estimated at \$100,000, including machinery. It is planned to rebuild. Royal D. Woolsey, Canastota, N. Y., heads the company.

The Manufacturers' Power Co., Rome, N. Y., plans the construction of a new power house on the State Barge Canal, estimated to cost \$110,000 with transmission system. M. J. Larkin is in charge.

The Riley Dry Dock Co., foot of Mechanic Street, Buffalo, is considering the construction of a branch shipbuilding and repair plant, with floating dry dock on Ellicott Creek, Tonawanda, N. Y. A site is being selected.

The Charlotte Cold Storage Co., Inc., Charlotte, N. Y., care of John Strobel, E. & B. Building, Rochester, N. Y., architect, is taking bids on a general contract for a new three-story ice-manufacturing and cold storage plant, estimated to cost \$250,000, with machinery.

The Gould Auto Electrical Co., 740-48 Main Street, Buffalo, operating an automobile battery and electrical repair works, will build a new one-story plant, 60 x 100 ft., on adjoining site. The owner of the premises, Edward B. Green & Sons, will also erect a one-story automobile service building, 100 x 150 ft., on another portion of the land, to include a complete machine and repair works.

The Common Council, Belfast, N. Y., is planning the installation of equipment at the municipal power house, including engine, air compressor, pumps and auxiliary apparatus, to replace the portion of the plant recently destroyed by fire.

The Wilna Motor Sales Co., Carthage, N. Y., plans the installation of an internal grinder for cylinder boring, and other equipment. F. L. Hatch is head.

The Empire Gas & Electric Co., Castle Street, Geneva, N. Y., contemplates the erection of a two-story building, 100 x 150 ft., for a mechanical shop and general operations.

The Rochester Gas & Electric Corporation, Rochester, N. Y., is planning a one-story power house at 26 Swan Street, estimated to cost \$50,000.

The Seaburg Mfg. Co., Steele Street, Jamestown, N. Y., plans for enlargements in its furniture manufacturing plant, to provide about 100,000 sq. ft. of additional floor space.

The Iroquois Gas Co., Buffalo, plans for the construction of a steel gas holder on Lackawanna Street, with equipment, estimated to cost \$200,000.

## Chicago

CHICAGO, May 7.

**O**RDERS from miscellaneous sources again seem to be falling off, but it is too early to say that market conditions have undergone any real change. On the contrary, continued industrial activity appears to point to further buying on a liberal scale. Most orders are for single machines, but some of these involve large outlays. For example, a local printing press manufacturer has purchased a 42 x 42-in. x 22-ft. motor-driven planer at a cost of about \$11,000. No further railroad buying has been reported, but the Elgin, Joliet & Eastern is at the point of placing orders against its extensive list. The Santa Fe has issued inquiries for 27 additional machines, raising the number of items on its outstanding list to over 100. The Chicago, Burlington & Quincy has issued an inquiry for a 400-ton wheel press and it is intimated that it may come into the market for considerable additional equipment soon.

The price situation shows little change. An Indiana manufacturer of turret lathes has advanced quotations about 10 per cent and practically all lines of shapers are now up approximately 10 per cent.

The new Santa Fe list of 27 motor-driven machines follows:

Five 2-in. Landis, or equivalent, double head bolt cutters.

One 2¼-in. Landis, or equivalent, single head bolt cutter.

One 24-in. Niles, or equivalent, slotter.

One Cincinnati, or equivalent, universal No. 3 single pulley drive milling machine.

One Diamond, or equivalent, guide bar grinder.

One 48-in. x 16-ft. engine lathe.

Two 48-in. Putnam, or equivalent, car wheel borers.

One No. 3 universal turret lathe.

One 90-in. Putnam, or equivalent, wheel lathe.

One Sundstrand radius link grinder.

One double end Putnam, or equivalent, axle lathe.

Two 24-in. shapers.

One 32-in. shaper.

Six 16-in. x 6-ft. portable bolt lathes.

Two 500-ton, 48-in. wheel presses.

The Foundry Chaplet & Supply Co., recently incorporated with \$20,000 capital stock, has built a plant at 2939-45 Mozart Street for the manufacture of foundry chaplets. Officers are W. B. Kilgore, president; W. O. Barthel, secretary and treasurer, and J. G. Stoeckert, vice-president.

The National Safety Switch Lever Lock Co., 3006 Cottage Grove Avenue, Chicago, recently incorporated with \$15,000 capital stock, will manufacture safety switch lever locks which can be used any place a padlock hangs. The company is undecided as to whether it will build or lease a plant and has made no arrangements as yet for the purchase of machinery. Officers are E. Tramble, president; N. D. Calloway, secretary and treasurer, and L. J. Cotton, general manager.

The Ford Motor Co., Detroit, contemplates the erection of a plant, 40 x 200 ft., at Adrian, Mich., for the manufacture of automobile parts.



The George Cutter Co., South Bend, Ind., subsidiary of the Westinghouse Electric & Mfg. Co., has purchased 39,000 sq. ft. on the east bank of the St. Joseph River as the site for a plant addition.

The Standard Wood Turning Co., 1750-8 West Austin Avenue, Chicago, is constructing a two-story addition, 100 x 108 ft., to cost \$40,000.

The Seng Co., manufacturer of hardware, 1450 Dayton Street, Chicago, has let contract for a one-story factory, 85 x 183 ft., to cost \$45,000.

The Chicago Malleable Castings Co., 1249 West 120th Street, Chicago, has let contract for a one-story building, 50 x 150 ft., to cost \$25,000.

The American Car & Foundry Co., 2416 South Paulina Street, Chicago, has awarded contract for a one-story assembling building for freight cars at that plant to cost \$100,000.

The United Mfg. & Distributing Co., manufacturer of phonograph motors, an air cleaner for air-cooled automobiles and certain standard radio parts, now located at 536 Lake Shore Drive, has purchased from the Doeblner Die Casting Co. its plant at the southeast corner of Cottage Grove Avenue and Ninety-seventh Street in the Burnside industrial district. The ground area is eight acres and is improved with a plant containing 60,000 sq. ft. of floor space.

The Reliance Steel Derrick Co., Topeka, Kan., will complete a new plant at North Tyler and Grant Streets within 30 days. It will cost \$15,000 and will be used for the fabrication of steel derricks.

The Cerro Gordo Brick & Tile Co., Iowa Falls, Iowa, is perfecting plans for a one-story works, estimated to cost \$42,000 including machinery. C. Q. Snyder is in charge.

The Dryden Rubber Co., 1014 South Kildare Avenue, Chicago, has filed plans for a one-story addition, 70 x 180 ft., estimated to cost \$50,000.

A manual training department will be installed in the two-story high school to be erected at Marble Rock, Iowa, estimated to cost \$85,000. J. G. Ralston, L. & R. Bank Building, Waterloo, Iowa, is architect.

Brenner, Monley & Morris, Inc., Chicago, care of Fox & Fox, 38 South Dearborn Street, architects, is taking bids on a general contract for a one-story copper rod and wire plant, 105 x 300 ft., on Kedzie Street, estimated to cost \$300,000 with machinery.

A manual training department will be installed in the three-story high school to be erected at Hunter, N. D., estimated to cost \$135,000. Joseph Rosatti, Reinecke Building, Fargo, N. D., is architect.

The Link Belt Co., 910 South Michigan Avenue, Chicago, manufacturer of elevating and conveying machinery, will soon break ground for a one-story machine shop addition at 310 West Pershing Road, 125 x 175 ft., estimated to cost \$90,000 including equipment.

A manual training department will be installed in the two-story and basement high school to be erected at Pana, Ill., estimated to cost \$125,000. O. L. Pillsbury, People's Bank Building, Bloomington, Ill., is architect.

The Common Council, Willmar, Minn., will soon take bids for a municipal electric power plant in conjunction with a waterworks system, estimated to cost \$150,000. Cory & Le Cocque, Aberdeen, S. D., are architects and engineers.

The Peoples Electric Service Co., Elkader, Iowa, is contemplating the erection of a hydroelectric generating plant on the Turkey River, to cost \$200,000 with machinery.

The Sioux City Brick & Tile Co., Sioux City, Iowa, has tentative plans for new works, including power house and machine shop, at Riverside, Iowa, estimated to cost \$100,000 with equipment. D. C. Mahoney is head.

S. H. Boeke, Jewell, Iowa, is arranging for the erection of a one-story ice and cold storage plant to cost about \$50,000.

## Indiana

INDIANAPOLIS, May 7.

BIDS will be received until May 19, by the Quartermaster, United States Army, Jeffersonville, Ind., for miscellaneous tools, including saw blades, milling cutters, dies, grinders, reamers, pliers, pipe taps, calipers, wrenches, etc., as specified in circular 23-102.

The Hartford Foundry Co., Hartford City, Ind., is considering the erection of a one-story addition, estimated to cost \$17,000 exclusive of equipment. J. C. Miller is superintendent.

The George J. Mayer Co., 36 South Meridian Street, Indianapolis, manufacturer of steel dies, metal specialties, etc., has acquired the plant and equipment of the American Art Metal Co., Dayton, Ohio. A portion of the machinery will be

removed to the plant at Mechanic and East South Streets at once, and the remainder will be brought to Indianapolis as soon as a new factory now in course of erection is ready. At that time the Mechanic Street works will be abandoned and the machinery removed to the new location. The company will also continue at the South Meridian Street building, where a new lease has been taken. Walter R. Mayer is secretary and treasurer.

Fisher & Whitney, Indianapolis, have arranged for the establishment of a machine shop at 827 Roanoke Street, to specialize in the production of automobile parts and repairs.

R. E. Castetter, Indianapolis, operating a planing mill at Moore and Christian Streets, is planning for the installation of additional equipment, including planers, saws, tables, woodworking tools, etc.

A manual training department will be installed in the new two-story and basement high school to be erected at Portland City, Ind., estimated to cost \$120,000, for which an architect will soon be selected.

The Inter-Continental Tire & Rubber Co., Anderson, Ind., has been organized to take over the plant and property of the Majestic Tire & Rubber Co., now in bankruptcy. The new owner will improve the plant and provide machinery for an output of 600 tires per day. The new organization is headed by J. D. Wiggins, president and general manager International Rubber Co., Anderson.

The Common Council, New Harmony, Ind., is planning the construction of a municipal electric light and power plant estimated to cost \$50,000, including machinery.

A manual training department will be installed in the new high school to be erected at South Bend, Ind., estimated to cost \$350,000, at Ewing Avenue and Fellows Street. The Board of Education is in charge.

Fire, April 27, destroyed a portion of the plant of the Martin Oil & Refining Co., Osborne, Ind., with loss estimated at \$200,000 including machinery. It is planned to rebuild.

The Carver Lumber Co., Shipshewana, Ind., is planning to rebuild the portion of its mill destroyed by fire April 28, with loss estimated at \$35,000 including equipment. The power house was seriously damaged.

## Cincinnati

CINCINNATI, May 7.

Local manufacturers of machine tools participated to a large extent in recent purchases of the Illinois Central Railroad, and with a number of railroad lists now outstanding and expected to be closed within a week or two, feel very much encouraged as to the future. Buying has been rather spotty, but no prolonged lull has been experienced. The Big Four Railroad is reported to have placed a number of orders, but has not bought as yet in a large way. The automotive industries are still taking machine tools, but buying from this source is not as heavy as in March and early April. Most of the tools are for replacement purposes. The Southern Railroad is reported to be preparing a list of its requirements which will be issued shortly. This road recently purchased 10 miscellaneous machines.

The General Motors Chemical Co., Dayton, has been organized to manufacture materials for ethyl gas, recently developed by Thomas Midgely and C. F. Kettering, of the General Motors Research Corporation. The company will locate in the buildings owned by the corporation at Moraine City. C. F. Kettering is president.

The Quad Stove Co., 76-82 East First Avenue, Columbus, Ohio, manufacturer of ranges and heaters, will double the capacity of its plant by the erection of an addition, 38 x 140 ft. Contract has been let and the work is expected to be completed about June 15.

The Model Machine Works, Frankfort, Ind., was damaged by fire April 30, the loss being estimated at \$30,000.

The J. M. Crawford Foundry Co., Pomeroy, Ohio, will erect an addition 60 x 90 ft., work to begin at once. Some new equipment will be installed. W. C. Wadsworth is general manager.

Color presses will be manufactured in Xenia, Ohio, by a company now being organized which has purchased the Omnigraph Co., now located at Des Moines, Iowa. It will be incorporated in Ohio, and will adopt a new name. Arrangements for moving the business from Des Moines to Xenia are being made and the company has secured the building formerly occupied by the Miami Cereal Co. in which manufacturing operations will be carried on. E. E. Strawn, inventor of the press, heads the new company.

## Cleveland

CLEVELAND, May 7.

**P**ROBABLY the outstanding feature of the machinery market was the activity which developed in foundry equipment at the exhibition in connection with the Cleveland meeting of the American Foundrymen's Association last week. Manufacturers of molding machines, handling and other foundry equipment report that orders and live inquiries received during the exhibit exceeded expectations.

Machine tool sales so far this month are holding up well as compared with April. Dealers are getting a good volume of small orders for from one to three machines. Buying by the large automobile companies in the Detroit district has quieted down and little has developed in the way of inquiry during the week. The Westinghouse Electric & Mfg. Co. the past week purchased six turret lathes from a local manufacturer and the Browning Co., Cleveland, purchased two turret lathes. The Akron, Canton & Youngstown Railroad, which recently inquired for seven machines, has postponed buying.

The Smith & Mills Co., Cincinnati, announces a price advance of from about 10 to 15 per cent on shapers, effective May 10. Other shaper manufacturers recently marked up prices.

The Whitman & Barnes Mfg. Co., Akron, Ohio, has acquired a 15-acre site in Coventry, near Akron, where it contemplates the erection of a new plant.

E. G. King and C. L. Fink will erect a new machine shop in Defiance, Ohio, which will be occupied by the Carl King Machine Shop. It will be one story, 44 x 100 ft.

It is announced that an expenditure of \$450,000 has been authorized for an addition to the works of the Wilson Foundry & Machine Co., Pontiac, Mich. The plans provide for an extension to the assembling plant and machine shop. The company has purchased two 52-in. boring mills from a Cleveland dealer. It is expected that considerable additional machinery will be required.

The Union Metal Mfg. Co., Canton, Ohio, will erect an extension at an estimated cost of \$120,000.

The plant of the Hercules Motor Mfg. Co., Canton, which has been in the hands of a receiver, has been sold by the Federal Court to E. A. Langenbach, president United Alloy Steel Corporation, Canton, for \$348,000.

Public sale of the plant of the Modern Glass Co., Toledo, Ohio, which includes a machine shop with grinding machines, lathes, milling machines, planers, etc., will be held at the Court House, Toledo, on Thursday, May 24, at 11 a. m. The plant also includes a power house and equipment and other machinery used in the manufacture of glass.

## Milwaukee

MILWAUKEE, May 7.

**W**ITH buying of machine tools by the automotive industries becoming more spotty and volume showing a decline because the bulk of requirements for the present are filled, the trade is looking toward railroad demand for new support. So far not much business has come from this source, but the local market is expectant, due to the fact that a number of construction and maintenance shop projects are developing in this locality. General industrial demand for tools is broadening and prospects are constantly improving as shops find it impossible to handle all business offered and are now compelled to enlarge. The shortage of labor is the only deterrent factor in this respect.

The labor situation passed May 1 without incident of trouble. The Milwaukee free employment office in April had 9056 requests for help and 7661 applications for positions; in April, 1922, 5383 requests and 5202 applications. Men for odd jobs, common and farm labor, and metal trades and building workers are especially in demand.

The Oliver Mining Co. has let contract to the Henry Hegner Construction Co., Appleton, Wis., for erecting a large mill for crushing stone for the manufacture of roofing material, at Iron Mountain, Mich. It will cost about \$100,000 complete.

The Quality Aluminum Castings Co., Waukesha, Wis., a new interest, broke ground May 1 for a foundry, 85 x 200 ft., and office building, 24 x 36 ft., to be ready about July 1. The general contractor is Paul F. Gierke, 816 Lincoln Avenue, local. A. C. Pankratz, 505 Lake Avenue, is president and general manager.

The Boynton Cab Co., 449-451 Milwaukee Street, Milwaukee, has plans for a new garage and maintenance building, 120 x 240 ft., two stories and basement, to be erected immediately at North Water and Knapp Streets. It will cost about \$150,000, including equipment. Frank A. Boynton is president and John F. Pergande, secretary.

The city of Wisconsin Rapids, Wis., has engaged Pearce, Greeley & Hansen Co., 39 West Adams Street, Chicago, to design a filtration plant for the municipal waterworks and sewerage system. Bids will be taken about July 1. The cost is estimated at \$30,000. C. P. Gross is superintendent.

The Wanner Malleable Castings Co., Hammond, Ind., has purchased the South Beloit, Wis., malleable foundry of the Stewart-Warner Co., Chicago, and will place it in operation about May 15 with a force of 125 to 150 men, which will be increased to 200 as rapidly as help becomes available. The Stewart-Warner foundry has been idle for the greater part of the past two years.

Nels Johnson, 1302 Washington Avenue, Racine, Wis., is organizing a \$25,000 corporation which will lease a building and install equipment for the production of aluminum rims for bicycle tires. He has been granted letters patent on twelve points and the exclusive right to manufacture the rims either by casting or by rolling and welding. The latter method will be used at the start.

The Wisconsin Steel Castings Co., Milwaukee, was chartered May 1 to manufacture steel castings and metal products. The capital consists of \$75,000 preferred and 1500 shares of common stock without par value. The principals are represented by Waldemar C. Wehe and Leo J. Landry, attorneys, 800 First Wisconsin National Bank Building, who later will give out details of the organization.

The West Allis Foundry Co., Seventy-fifth and Elm Street, West Allis, has sold its plant to Alfred M. Jones, proprietor of A. M. Jones & Co., 812 Mayer Building, 288 East Water Street, Milwaukee, manufacturers of foundry equipment and dealers in machinery, castings, etc. The new ownership will continue the production of gray iron and semi-steel castings. Henry Schouten was president and treasurer of the West Allis company.

The Belle City Malleable Iron Co., Racine, Wis., which recently completed a new annealing shop, is starting work on another building replacing existing structures containing the core-room, mill room, laboratory, factory offices, lockers, etc. It will be 144 x 232 ft., of brick and steel, and cost about \$150,000. The construction of a new casting shop, which is projected as the third unit of the general plant replacement program, probably will be deferred until 1924, owing to the shortage of labor and high construction costs.

The Manufacturers Box Co., 32-42 Keefe Avenue, Milwaukee, will build a full second story, 100 x 120 ft., and is buying additional machinery, motors and other equipment for manufacturing paper and corrugated boxes and shipping cases. It is owned by a group of Milwaukee boot and shoe manufacturers. E. A. Luedke is secretary and treasurer.

Grossman Brothers-Parelskin-Gordon, Inc., is a new \$50,000 corporation organized in Milwaukee to consolidate two scrap and salvage concerns, the Grossman Brothers Co., 240-260 Madison Street, and Samuel N. Parelskin, 160 Reed Street. The yards will be enlarged and additional handling equipment will be purchased. Joseph Grossman is president and general manager.

The D. & D. Hanger, Panel & Glue Co., Sheboygan, Wis., manufacturer of veneers, panels, advertising novelties, etc., will build a new factory costing \$50,000 at Fifteenth Street and Georgia Avenue, and install machinery for the manufacture of trunks and boxes. It will be 80 ft. sq., four stories and basement. Herman Davis is president.

Richey, Browne & Donald, Inc., has been organized at Madison, Wis., with \$300,000 capital to manufacture metal articles. The principals are A. R. Richey, R. B. Browne and J. S. Donald. Information concerning their plans will be made public later.

Arthur Schumacher, Delavan, Wis., has plans by Henry C. Hengels, architect, 445 Milwaukee Street, Milwaukee, for a two-story garage and machine shop, 50 x 125 ft., on which bids are being taken until May 20. It will cost about \$38,000 with equipment.

The Board of Education, Kewaskum, Wis., is asking bids until May 22 for the erection of a new high school, 65 x 132 ft., three stories, with manual training shops, estimated to cost \$130,000. The architects are Robert A. Messmer & Brother, 221 Grand Avenue, Milwaukee. L. D. Guth is clerk of the board.



The Feibach Mfg. Co., Mayville, Wis., has been incorporated with a capital stock of \$25,000 and will erect a factory to manufacture shock absorbers and other automotive equipment. Frank L. McNamara, attorney, 68 Wisconsin Street, Milwaukee, is completing the organization.

The Village of River Falls, Wis., is taking bids through F. V. Williams, clerk, for a 200-250-hp. internal oil combustion engine, and a 2300-volts, 170-200 kva, alternator, switchboards, and a 15,000-gal. steel fuel oil storage tank.

The Prime Mfg. Co., 653 Clinton Street, Milwaukee, brass founder and manufacturer of railroad and automobile castings and materials, has increased its capital stock from \$250,000 to \$500,000 for enlargement. Orton L. Prime is president and D. T. Allen manager.

The Modern Brass Mfg. Co., Schleisingsville, Wis., has changed its name to the Modern Foundry Co. and intends to extend operations to include casting of iron and aluminum in addition to brass and bronze.

The Flambeau Paper Co., Park Falls, Wis., has let contracts for the erection of a machine shop, locomotive shop and general maintenance and service plant costing \$150,000 and is now buying equipment. The architects are Brust & Philipp, 405 Broadway, Milwaukee.

The Board of Education, Viroqua, Wis., expects to be ready for bids June 1 on a new \$150,000 high school, 100 x 195 ft., two stories and basement, designed by E. J. Hancock, architect, Eau Claire, Wis. Provision is made for manual training shops. C. F. Dahl is president of the board.

## The Gulf States

BIRMINGHAM, May 7.

PLANS are being considered by the Tallahassee Iron Works, Tallahassee, Fla., for rebuilding the portion of its works recently destroyed by fire, with loss estimated at \$50,000 including equipment. A new machine shop will be built and a list of machine tools and equipment will be arranged at once. R. O. Collins heads the company.

W. M. Smith & Co., P. O. Box 1709, Birmingham, is in the market for a used locomotive crane in good condition.

The Clearwater Cooperage Co., Clearwater, Fla., recently organized with a capital of \$250,000, plans the construction of works to cost \$100,000. A power house will be built. C. E. Murray is president.

A manual training department will be installed in the proposed new high school to be erected at Denton, Tex., estimated to cost \$125,000, for which an architect will soon be selected.

The Southern Pacific Railroad Co., Houston, Tex., has commenced the construction of new locomotive and car repair shops at Lafayette, La., to include a machine shop, 80 x 100 ft., locomotive repair shop, power house, oil house, engine house and other buildings, estimated to cost \$400,000, including equipment. H. M. Lull is chief engineer.

The Peavy-Moore Lumber Co., Deweyville, Tex., will break ground at once for a new lumber mill and power house, estimated to cost \$500,000 with machinery. A machine shop will be constructed.

The Rule-Jayton Cotton Oil Co., Stamford, Tex., has acquired the oil mill of the Stamford Oil Co. Plans are in progress for extensions and improvements and the installation of additional crushing machinery, power, and other equipment.

The Hiflin Light Co., Heflin, Ala., plans the construction of a hydroelectric power station. W. M. Dobson is manager.

The Common Council, Crestview, Fla., will take bids until May 28 for machinery for a municipal power plant, to include a 65 hp. semi-Diesel type oil engine; 40 kw. generator; exciter, electric switchboard and auxiliary equipment. J. D. Carter, Geneva, Ala., is construction engineer.

The Fox Shale Brick Co., Tuscaloosa, Ala., recently organized, is contemplating the construction of a new brick manufacturing plant, to include a power house. James G. Foster is president.

The Ford Motor Co., Highland Park, Mich., has work under way on a new assembling plant at New Orleans, estimated to cost \$2,500,000 including machinery.

The International-Great Northern Railway Co., Houston, Tex., has arranged an appropriation of \$25,000 for the purchase of additional equipment for locomotive and car repair shops. A fund of \$310,000 has also been appropriated for the purchase of heavy machinery.

The Riecke Cabinet Works, Inc., New Orleans, has acquired 85,000 sq. ft. and plans the erection of a new factory to cost \$50,000, including machinery.

The Common Council, Edgewood, Tex., has authorized plans for the installation of a municipal electric plant.

The Orlando Mfg. Co., P. O. Box 1256, Orlando, Fla., manufacturer of metal products, has inquiries out for com-

plete machine shop equipment, including lathes, milling machine, drill press, grinder, bench and hand tools.

A manual training department will be installed in the high school to be erected at Talladega, Tex., estimated to cost \$100,000, for which an architect will soon be selected.

The Alabama Water Co., Albany, Ala., is planning for the installation of electrically-operated pumping machinery. Other extensions and improvements will be made to cost \$100,000.

The Southern Pacific Railroad Co., El Paso, Tex., will build a locomotive erecting shop, 86 x 255 ft., at its local repair plant, in connection with a number of other buildings. One 200-ton and one 15-ton traveling crane will be installed. Work has commenced on a one-story boiler shop, 32 x 110 ft., and machine shop. The cost will exceed \$300,000, including machinery.

The Urbana Sand & Gravel Co., Urbana, Tex., is in the market for a 60 kw. generator, exciter, motor and auxiliary electric equipment.

The Board of Commissioners, Russellville, Ala., has authorized plans for a municipal electric light and power plant, estimated to cost \$45,000. A. N. Falls is president.

The Common Council, Cruger, Miss., will commence the erection of a one-story municipal electric light and power plant estimated to cost \$65,000.

The Stevens Pyrites Pressed Brick Co., Tampa, Fla., recently formed with a capital of \$150,000 has acquired a site and will have plans drawn at once for works to manufacture pressed brick and to cost approximately \$80,000, with machinery. Fremont C. Stevens is president.

The United States Engineer Office, 329 Custom House, New Orleans, will take bids until May 23 for one 15-in. pump for dredging service.

## The Central South

ST. LOUIS, May 7.

PLANS are in preparation for an addition to the works of the Oklahoma Steel Castings Co., Tulsa, Okla., to double the present output. It will cost close to \$50,000, with equipment. E. H. Cornelius is president.

The Missouri Pacific Railroad Co., St. Louis, is arranging an appropriation of \$925,000 for extensions and improvements in its shops and engine terminals at St. Louis; Wichita, and Osawatomie, Kan.; and Van Buren, Ark., to include new machine and repair shops with additional machinery. It will also build a power house in connection with its proposed grain elevator at St. Louis, estimated to cost \$1,000,000, including electrically-operated drying, elevating, conveying and other machinery.

The Crystal Carbonate Lime Co., Louisiana, Mo., is in the market for crushing machinery and other equipment for a new plant.

A manual training department will be installed in the proposed high school to be erected at Henrietta, Mo., estimated to cost \$90,000, for which an architect will soon be selected.

The Acme Brick Co., Fort Worth, Tex., has acquired the plant and business of the Fort Smith Brick Co., Fort Smith, Ark. Plans are under way for extensions to double the present output, estimated to cost about \$60,000, including machinery. W. R. Bennett is president.

The Wichita Piston Co., 631 North Main Street, Wichita, Kan., plans for the installation of a lathe, drill press and other equipment.

The La Follette Water, Light & Telephone Co., La Follette, Tenn., plans extensions in its hydroelectric power plant and the installation of additional equipment.

The Duncan Machinery Co., P. O. Box 265, Knoxville, Tenn., machinery dealer, is in the market for a horizontal stationary steam engine, either center or side crank.

G. C. Eschbacher, 3436 Osage Street, St. Louis, is in the market for equipment for a cabinet shop, including lathes, planer, bench tools, light wood-working machinery, etc.

The American Greenhouse Mfg. Co., 714 New York Life Building, Kansas City, Mo., is planning the erection of a new one and two-story factory, estimated to cost \$50,000, including metal-working and other machinery.

The Common Council, Milan, Tenn., plans extensions and improvements in the municipal electric light and power plant, estimated to cost \$40,000 with equipment.

A manual training department will be installed in the proposed high school to be erected at Norton, Kan., estimated to cost \$90,000. R. L. Gamble & Co., 608 Kansas Avenue, Topeka, Kan., are architects.

The Industrial Electric Co., 1858 North Lawrence Street, Wichita, Kan., has inquiries out for a lathe, drill press and other equipment. L. D. Crain is head.

The Duemler-Crump Automobile Works, 2457 North Boulevard, Springfield, Mo., operating a machine and repair plant, is planning the erection of a new two-story structure at 413 West Walnut Street, estimated to cost \$23,000, exclusive of equipment. A. W. Duemler is head.

The Van Buren Brick & Tile Co., Van Buren, Ark., has plans for new works, estimated to cost \$50,000, including machinery. An electric shovel will be installed at the clay properties. H. C. Rains is secretary and treasurer.

The Victor Motors, Inc., St. Louis, recently organized with a capital of \$3,000,000, plans the construction of a works in this section for the manufacture of motor trucks and parts. The initial units are estimated to cost \$500,000 with machinery. Guy Wilson, one of the organizers of the Traffic Motor Truck Corporation, 5200 North Second Street, heads the new company.

The Arkansas Central Power Co., Little Rock, Ark., recently organized under the auspices of the Electric Bond & Share Co., 71 Broadway, New York, to take over the plant and properties of the Little Rock Railway & Electric Co., plans extensions and improvements and the installation of additional equipment. A portion of a bond issue of \$2,500,000 now being sold will be used.

A manual training department will be installed in the new high school to be erected at Almena, Kan., estimated to cost \$100,000, for which Smith & English, Nelson Building, Hutchinson, Kan., are architects.

The Marsh & York Lumber Co., Elizabethton, Tenn., is in the market for a 50 hp. oil-operated engine and auxiliary equipment.

The Athens Glass Works, Inc., Morgantown, W. Va., is planning the construction of a new branch factory at Ada, Okla., estimated to cost \$50,000 with machinery and power equipment.

The Downard-Manning Coal Co., 1024 Inter-Southern Building, Louisville, recently organized, is planning for the installation of electrical equipment and mining machinery at its coal properties. C. Paul Downard is president.

The Common Council, Ponca City, Okla., is planning for extensions and improvements in the municipal electric power house, to cost about \$150,000 including additional equipment.

## The Pacific Coast

SAN FRANCISCO, May 2.

**H**ENRY DISSTON & SONS, INC., Tacony, Philadelphia, is planning the erection of a one-story branch plant at Seattle, Wash., 125 x 150 ft., estimated to cost \$70,000. The local office of the company is at 322 Occidental Street.

The Los Angeles Railway Co., Pacific Electric Building, Los Angeles, will have plans drawn at once for a new unit at its repair works at Fifty-fourth Street and South Park Avenue, 100 x 400 ft., estimated to cost \$150,000, with machinery. The Engineering Department is in charge.

The Schlage Mfg. Co., 315 Montgomery Street, San Francisco, J. B. Ruegg, president, manufacturer of door locks and other hardware products, is considering a site at Martinez, Cal., for a new plant. It will be one-story and will cost \$50,000.

The Columbia County Lumber Co., St. Helens, Ore., is planning to rebuild its lumber mill and power house destroyed by fire April 23, with loss estimated at \$300,000 including equipment.

The Placencia Orange Growers' Association, Placencia, Cal., will commence the erection of two ice-manufacturing and precooling plants, each 125 x 145 ft., at Placencia and Fullerton, Cal., estimated to cost \$75,000 and \$85,000.

The Continental Furniture Mfg. Co., San Francisco, has acquired 5 acres at Slauson Avenue and Fifty-ninth Street, Los Angeles, for a new plant, to include a power house. Plans will be prepared at once by S. Heiman, 57 Post Street, San Francisco, architect.

The Christie Machine Works, Inc., East Beale Street, San Francisco, will erect a three-story building to cost \$45,000 and a one-story machine shop to cost \$18,000, exclusive of equipment.

A manual training department will be installed in the high school to be erected by the Lemoore Union High School District, Lemoore, Cal., for which bonds for \$350,000 have been approved.

The Modesto Irrigation District, Modesto, Cal., will build a hydroelectric power plant on the Tuolumne River, Stanislaus County, with capacity of 17,000 hp., estimated to cost \$360,000.

The Payne Furnace & Supply Co., Los Angeles, recently organized to succeed to the plant and business of D. W.

Payne & Son, 158 North Los Angeles Street, manufacturer of gas furnaces, sheet metal products, etc., has purchased additional property and plans extensions and the installation of more equipment.

The Eastern Oregon Light & Power Co., Baker, Ore., plans the construction of a new steam-operated electric generating plant, estimated to cost \$100,000.

The Bear River Water & Power Co., Auburn, Cal., will build a hydroelectric generating plant on the Bear River, estimated to cost \$200,000.

The Pacific Fruit Express Co., San Francisco, a subsidiary of the Southern Pacific Railroad Co., will commence the erection of a one-story addition to its ice-manufacturing and precooling plant at Roseville, Cal., 110 x 185 ft. The machinery installation will cost approximately \$200,000.

Ross, Inc., 5414 Rainier Avenue, Seattle, Wash., recently organized to manufacture electric ovens and heating appliances, has obtained a factory and purchased equipment. Bids are now being received on work which the company proposes to let out on contract. A. R. Ross heads the company.

The Telford Engineering Co., Oakland, Cal., has been incorporated with capital stock of \$75,000 to manufacture ice machines and kindred equipment. Refrigerating units are built under contract. It is planned to receive bids from Eastern factories on all parts that enter into the construction of these machines. Assembling is to be done in the company's plant. It is in the market for equipment and materials that enter into this construction. Machines are now obtainable of capacity from 1/2 ton up to and including 38 tons. Agencies will be established throughout the country. Address P. L. Keller, 804 Liberty Bank Building, San Francisco.

## Canada

TORONTO, May 7.

**W**HILE sales of machine tools for the month of April were somewhat below those of March, the general demand was not less active. During March a large list was placed by the Canadian National Railways for tools and equipment for western Canada shops and sales sheets showed the effect of this large order. In April no large lists were issued, but a very fair volume of business was done in small lots. Among industrial plants business is steadily improving and manufacturing operations are being extended. Inquiries for machinery and tools are numerous and small sized lists are becoming prominent. Small tools are moving freely.

The Wilkie Products Co., Simcoe, Ont., is building an addition to cost \$125,000 and is asking for machinery and equipment for the manufacture of specialties.

The Gates Engineering Co., Montreal, wants machinery and equipment for manufacture of fire brick, locomotive blocks, stove lining, etc.

L. J. Menard, St. Michael Des Saints, Que., is in the market for traveling carriage saw, drum saw, shingle saw, shaper, electrical equipment, etc., for a sawmill.

The Gilbert Boat Co., Brockville, Ont., is interested in equipment for a machine shop, to replace that recently destroyed by fire.

The Laughlin Products, Ltd., Stratford, Ont., has taken over the building formerly occupied by the Stratford Bridge & Iron Works, and will install equipment for the manufacture of a new kind of oil burner.

The Toronto Electric Commissioners, Toronto, will purchase overhead cranes.

Bids are being received by the town of Hanover, Ont., for centrifugal pumps, gasoline engines, gate valves, etc., and the construction of pump house, concrete reservoir, etc. John Taylor is clerk.

The Starr Phonograph Co., 190 Dundas Street, London, Ont., has purchased a building which it will remodel for manufacturing purposes.

Construction work has been started by the Feagles Construction Co., Ltd., on an addition to the elevator at Fort William, Ont., to cost \$600,000, for the Western Terminal Elevator Co., Winnipeg. One work shop and 38 concrete tanks, 90 ft. high x 20 ft. in diameter, are included in the extensions. Owners will buy equipment.

The Muskoka Wood Mfg. Co., Huntsville, Ont., will erect a boiler house, 40 x 40 ft., of concrete and brick.



The Dominion Construction Co., 509 Richards Street, Vancouver, B. C., has the general contract for the super-structure for a grain elevator to be erected at Vancouver, B. C., at a cost of \$450,000 for the E. A. Woodward Co., Ltd., Winnipeg.

Winston Brothers, Elko, B. C., have started work on a \$250,000 hydroelectric development plant for the East Kootenay Power Co., Elko. The contract includes the construction of a power dam on the Kootenay River, and boring a tunnel 2000 ft. long, 12 x 14 ft., mostly through solid rock.

H. McCann, 158 Wilson Street, Hamilton, Ont., is in the market for a Muzzle electric furnace, 12 x 8 x 19, 25 cycle, 110 volts.

The Seaman Paper Co., Chicago, Ill., is completing plans for the erection of pulp and paper mills on Burrard Inlet

in British Columbia, to cost approximately \$8,000,000. The mill will have a daily capacity of between 200 and 300 tons and will give employment to upward of 1000 men.

The machine shops of the Esquimalt & Nanaimo Railway Co., North Wellington, near Nanaimo, B. C., were destroyed by fire May 1 with a loss estimated at \$80,000.

The Norton Co., Worcester, Mass., will enlarge its electric furnace plant at Chippewa, Canada, by the addition of a furnace building 70 x 150 ft., to be used exclusively for the manufacture of carbide of silicon abrasive, known to the trade as crystolon. Other buildings for storage and the like will be added, and there will be some rearrangement of existing facilities, to give a total increase in capacity of 25 per cent. The supply of this raw material at the Worcester plant has become inadequate, making immediately necessary further production units.

## STEEL AND INDUSTRIAL STOCKS

### Bear Pressure Brings a Break—Violent Liquidation and Net Declines Despite Industrial Activity

With business to the brim and no discernible cause for a drop, steel and industrial stocks presented the paradox of a severely declining market. The order followed through the week was decline, irregularity, a faint but short-lived recovery which brought dullness, then back again. There was continued and violent liquidation in industrials. Bear pressure, begun last week, broke the bounds and passed beyond control. Real activity was spasmodic. Steel common sold in large volume on Tuesday, making it yield a point. Favorable trade reports were bracing, but their force was soon spent. Drilling near Colorado Fuel & Iron properties and cessation of work in one of the company's shafts due to oil come in for much talk by the speculative group seeking to brace that stock. The opinion is expressed that still lower figures are inevitable before a truly robust rally may be seen.

The range of prices on active iron and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers.....	47	45 7/8	Int. Har. pf.....	111	112
Am. B. & S. Fdry. 74	78		Lima Loco.....	64 1/2	71 1/2
Am. B. S. & F. pf. 108	108		Midvale Steel.....	29 1/2	31 1/2
Am. Can.....	87	94 3/4	Nat.-Acme.....	14 1/2	15
Am. Can. pf.....	107	107 1/2	Nat. E. & Stm. pf.	65 1/2	68 1/2
Am. Car & Fdry.....	166 3/4	176 1/2	N. Y. Air Brake.....	48 1/2	50 1/2
Am. Car & F. pf.....	120 1/4	120 1/4	Nova Scotia Steel.....	20 1/2	22 1/2
Am. Locomotive.....	127	134 3/4	Otis Steel.....	9 1/2	11 1/2
Am. Locomotive pf. 115	116 3/4		Otis Steel pf.....	57	64
Am. Radiator.....	82 1/2	85 1/4	Pressed Steel.....	61 1/2	66
Am. Radiator pf.....	120 1/4	120 1/4	Pressed Steel pf.....	90	90
Am. Steel Fdries.....	36 3/4	39	Ry. Steel Spring.....	109 1/2	114
Am. Steel Fdr. pf. 100 1/2	100 1/2		Replodge Steel.....	21	24 1/4
Baldwin Loco.....	127 1/4	137 3/4	Republic.....	52 1/4	61 1/4
Bethlehem Steel.....	58 1/2	63 1/2	Republic, pf.....	93	94 1/2
Beth. Stl. 7% pf.....	95	95	Sloss.....	52	57 1/2
Brier Hill.....	17	17	Steel of Canada.....	74 3/4	78
Br. Em. Steel.....	7 1/2	7 1/2	Superior Steel.....	30 1/2	31
Br. Em. S. 2d pf.....	20 1/2	21	Superior S. 1st pf.	96 1/4	96 1/4
Chic. Pne. Tool.....	79	82 1/4	Transue-Williams.....	35 1/4	37 3/4
Colorado Fuel.....	29	33 3/4	Un. Alloy Steel.....	35	36 1/2
Cruible Steel.....	69	78	U. S. Pipe.....	25 3/4	29
Cruible Steel pf.....	90 1/4	91 3/4	U. S. Pipe, pf.....	66 3/4	66 3/4
Deere, pf.....	71 1/2	72	U. S. Steel.....	101 1/2	105 1/4
General Electric.....	172	178	U. S. Steel pf.....	118	118 3/4
Gt. N. Ore Cert.....	30 1/4	31 1/4	Vanadium Steel.....	32 3/4	37 1/4
Gulf States Steel.....	83 1/2	94 3/4	Va. I. C. & Coke.....	61	63
Inland Steel.....	44	44	W'house Air Br.....	84	86 1/2
Int. Har.....	86	88 1/4			

### Industrial Finance

The Modern Machine Tool Co., 601 Water Street, Jackson, Mich., is planning to increase its capital stock by issuing preferred in order to provide for the manufacture of a combined drill table vise and cutting-off machine, designed for railroad, automobile and small shop work. H. G. Walker is manager.

A meeting of the General Refractories Co. has been called for July 7 to approve the issuance of 45,000 shares of additional stock at \$50, proceeds to be used for the acquisition of the American Refractories Co.

The Colorado Fuel & Iron Co. in the first quarter of this year showed a surplus of \$382,713, against a deficit of \$431,269, as in the three months ending with March, 1922. Gross receipts for the first quarter of this month were almost double those for the corresponding period last year, being \$11,259,580 and \$6,575,661, respectively. Net earnings were \$1,395,359, or \$799,156 larger than those last year. From other sources the total net income was brought up to \$1,492,319, as compared with \$661,049 last year. Amounts deducted for interest, taxes, sinking fund, depreciation, etc., were practically the same the first quarter of this year as in 1922.

The comeback in the small tool business is clearly reflected in the report of the Greenfield Tap & Die Corporation, Greenfield, Mass., for the first three months of this year. In that period the company earned \$164,000, or about \$1,000 more than it did during the whole of 1922. Inventories and borrowings are \$500,000 less than at the peak of 1922, while unfilled orders on the books of the corporation double in number and value those of a year ago. The company is employing 100 per cent more than it did March 1, 1922.

A voluntary petition in bankruptcy was filed April 23 in the Federal Court at Milwaukee by the Turner Mfg. Co., Port Washington, Wis., operating a large foundry and machine shop, manufacturing gas engines, tractors, tillage tools, etc. The petition was signed by W. J. Niederkorn, secretary. Schedules admit liabilities of \$236,550 and claim assets of \$363,687. Unsecured claims are listed at \$206,008 and consist mostly of notes for cash advanced or given in payment of merchandise. Principal items of assets are: real estate and buildings, \$77,119; machinery and equipment, \$135,590; stock in trade, \$123,776.

The Manistee Drop Forge Co., Filer City, Mich., has filed papers assigning its assets of \$12,757 exclusive of its property assets which are listed at \$75,000. The liabilities total \$20,543 in accounts payable and \$131,800 in outstanding bonds. Among the principal bondholding creditors are Sands & Burr, bankers, Manistee, \$50,000; the Manistee County Savings Bank, Manistee, \$40,000; Filer Fibre Co., Filer City, \$8,000; and C. G. Briggs, trustee, Manistee, \$10,000.

The Rich Steel Products Co., Battle Creek, Mich., capitalized at \$3,500,000 of which \$2,000,000 has been issued, and which was a closed corporation, has placed \$700,000 of its common stock on the market. Employees subscribed for \$200,000 worth of the stock. The new capital will be utilized in plant additions at Battle Creek and Los Angeles.

Bankers have sold the 140,000 shares of the Eaton Axle & Spring Co. no par stock, subject to authorization by stockholders. With the completion of this financing capitalization reaches 250,000 shares, of which 220,000 will be outstanding.

The A. O. Smith Corporation, Milwaukee, pressed steel automobile and motor truck frames, has sold \$5,000,000 6 1/2 per cent 10-year first mortgage bonds to bankers, who have disposed of the issue. Proceeds derived for their sale will be used to redeem \$2,428,000 outstanding five-year notes, for completion of plant extensions, for new equipment and for working capital.

The Eastern Rolling Mill Co. in March showed net profits of \$137,722, bringing the total for the first quarter to \$394,011.

Net earnings of the American Steel Foundries for the first quarter aggregated \$1,883,449, or \$1,144,721 more than those for the corresponding period last year. The company allowed \$320,380 for depreciation, nearly double the amount allowed in 1922. Net profit of \$1,529,325 was shown after interest charges, etc., against \$477,439 in 1922.

The Calorizing Co., Pittsburgh, has been organized with capital stock of \$750,000 in preferred and 100,000 shares of common no par value to acquire the assets and business of the Calorizing Co. of Pittsburgh, which has developed commercially a heat treating process originated by the General Electric Co., whereby aluminum is driven into the surface of iron, steel and other metals, to obtain greater resistance to high temperatures and to corroding agencies. Headquarters will be located in Pittsburgh. The General Electric Co., according to the agreement, will own 25 per cent of the common stock. Among the directors are: Brooks L. Jarrett, president; A. V. Farr, vice-president; P. S. Chess, secretary; S. F. Cox, chief engineer; Walter M. Stearns, General Electric Co.; C. McK. Lynch of Moore, Leonard & Lynch; Maurice L. Farrell of F. S. Smithers & Co., and J. de S. Freund, American Cement Tile Mfg. Co.

# Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

## Iron and Soft Steel Bars and Shapes

<b>Bars:</b>	
Refined iron bars, base price	3.54c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees	
3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in.	
x ¼ in., base	3.54c.

## Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.80c.
Toe-calk, ½ x ¾ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth spring-steel	5.00c. to 7.50c.
<b>Shafting and Screw Stock:</b>	
Rounds	4.40c. to 4.65c.
Squares, flats and hex.	4.90c. to 5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

## Tank Plates—Steel

¼ in. and heavier	3.64c.
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## Sheets

### Blue Annealed

	Per Lb.
No. 10	4.59c.
No. 12	4.64c.
No. 14	4.69c.
No. 16	4.79c.

### Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.90c. to 5.30c.	5.60c.
Nos. 22 and 24	4.95c. to 5.35c.	5.60c.
No. 26	5.00c. to 5.15c.	5.65c.
No. 28	5.10c. to 5.50c.	5.75c.
No. 30	5.30c. to 5.75c.	5.75c.

No. 28 and lighter, 36 in. wide, 10c. higher

### Galvanized

	Per Lb.
No. 14	5.20c. to 5.60c.
No. 16	5.35c. to 5.75c.
Nos. 18 and 20	5.50c. to 5.90c.
Nos. 22 and 24	5.65c. to 5.95c.
No. 26	5.80c. to 6.20c.
No. 27	5.95c. to 6.35c.
No. 28	6.10c. to 6.50c.
No. 30	6.60c. to 7.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

## Welded Pipe

### Standard Steel

	Black	Galv.		Black	Galv.
½ in. Butt...	—44	—29	½ in. Butt...	—4	+19
¾ in. Butt...	—49	—36	¾ in. Butt...	—11	+9
1-3 in. Butt...	—52	—33	1-1½ in. Butt...	—14	+6
2½-6 in. Lap...	—48	—35	2 in. Lap...	—5	+14
7-8 in. Lap...	—44	—17	2½-6 in. Lap...	—9	+9
9-12 in. Lap...	—38	—14	7-12 in. Lap...	—3	+16

### Wrought Iron

## Steel Wire

	BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.00c.	
Annealed soft	5.00c.	
Galvanized annealed	5.65c.	
Coppered basic	5.65c.	
Tinned soft Bessemer	6.65c.	

\*Regular extras for lighter gage.

## Brass Sheet, Rod, Tube and Wire

### BASE PRICE

High brass sheet	21½c. to 22½c.
High brass wire	22½c. to 23½c.
Brass rods	19½c. to 20½c.
Brass tube, brazed	28½c. to 29½c.
Brass tube, seamless	25½c. to 26½c.
Copper tube, seamless	27½c. to 28 c.

## Copper Sheets

Sheet copper, hot rolled, 24 oz., 25½c. to 26½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

## Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Coke—14 x 20	Prime	Seconds
			80 lb.	\$6.30	\$6.05
			90 lb.	6.40	6.15
			100 lb.	6.50	6.25
IC.	\$11.00	\$9.75	IC.	6.65	6.40
IX.	12.25	11.00	IX.	7.65	7.40
IXX.	13.50	12.25	IXX.	8.65	8.40
IXXX.	14.75	13.50	IXXX.	9.65	9.40
IXXXX.	16.50	14.75	IXXXX.	10.65	10.40

## Terne Plates

	8-lb. coating, 14 x 20
100 lb.	\$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

## Tin

Straits pig	48c.
Bar	55c. to 60c.

## Copper

Lake ingot	18½c.
Electrolytic	18 c.
Casting	17½c.

## Spelter and Sheet Zinc

Western spelter	8 c.
Sheet zinc, No. 9 base, casks	10½c. open 11½c.

## Lead and Solder\*

American pig lead	9¼c. to 9½c.
Bar lead	12½c. to 14c.
Solder, ½ and ½ guaranteed	33½c.
No. 1 solder	31½c.
Refined solder	28c.

\*Prices of solder indicated by private brand vary according to composition.

## Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb.	35c. to 50c.
Grade D, per lb.	25c. to 35c.

## Antimony

Asiatic	9c. to 9½c.
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## Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	32c. to 33c.
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## Old Metals

Business is very quiet and the market dull. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	13.75
Copper, heavy wire	12.75
Copper, light and bottoms	11.00
Brass, heavy	7.50
Brass, light	6.00
Heavy machine composition	10.50
No. 1 yellow brass turnings	7.75
No. 1 red brass or composition turnings	9.00
Lead, heavy	6.50
Lead, tea	4.75
Zinc	4.50